CODE NO.: 38144-154-210

AKAI SERVICE MANUAL

COLOUR TV RECEIVER
REMOTE CONTROL SYSTEM
CHASSIS NO.: P58SC(H) & RM109
MODEL NO.: CT2125UK/AKAIX

SAFETY CAUTION:
Before servicing this chassis , it is important that the service technician reads and follows the "Safety Precaution" and "Product Safety Notice" in this Service Manual.

SPECIFICATIONS

Receiving System	PAL - I
Receiving Channel	UHF CH : 21 - 69
Channel Selection System	43 Keys Voltage Synthesizer Tuning and Remote Control
Audio Output	3W at 10% Distortion
Picture Tube	21" (54HGB99X-ITC)
Power Requirements	AC 240V , 50Hz
Power Consumption	83W
Dimensions	580(W) X 567(D) X 570(H)mm
Gross Weight	24.5Kg

For improvement purposes specification and design are subject to change without notice.

11. APC ADJUSTMENT

1) Receive the colour bar pattern.
2) Connect TP23 to TP24 with jumper (TDA3651A).
3) Pin 1 to 6 with short (TDA3651A).
4) Control the Trimmer CV101 on the main PCB to get the colour.

12. COLOUR PURITY ADJUSTMENT

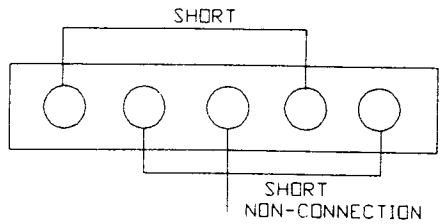
Note: Before attempting any purity adjustments, the receiver should be operated for at least fifteen minutes. The purity adjustment requires Rubber Wedge kit.

1) Demagnetize the picture tube and cabinet by using a degaussing coil.
2) Turn the CONTRAST and BRIGHTNESS controls to maximum.
3) Receiver the green colour pattern.
4) Loosen the clamp holding the yoke, and slide the yoke backward or forward to provide the vertical green belt (zone) in the picture screen.
5) Remove the Rubber Wedges.
6) Rotate and spread the tabs of the purity magnet (See Fig. 4) around the neck of the picture tube until a green belt is obtained in the centre of the screen.
   And at the same time, centre the raster vertically by adjusting the magnet.
7) Move the yoke slowly forward or backward until a uniform red screen is obtained. Tighten the clamp screw.
8) Check the purity of the red and bule raster.
9) Tighten the clamp screw of the yoke temporarily.
10) Obtain a white raster referring to "CRT WHITE BALANCE ADJUSTMENT".
11) Proceed with the convergence adjustment.

13. SCREEN VOLTAGE & WHITE BALANCE ADJUSTMENT

1) PREPARATION

a. Operate the receiver at least 20 minutes before attempting the white balance adjustment.
b. Connect A.C. line and the receiver power switch sets in "ON" position.
c. Receive a black and white signal (Lion head pattern is better).
d. Set colour control to the center position.
e. Set the brightness and contrast controls to the "PP" position.
f. Set the red, blue and green drive controls to the mechanical center position.
g. Set the blue and green drive controls to the machanical center position.
h. Set the screen VR control on FBT to the minimum position (fully counter-clockwise).
i. Connect the CN201 connector as the following.



2) STEPS

a. Rotate the SCREEN control on FBT(T444) gradually clockwise until the first horizontal line appears slightly on the screen.
b. Adjust the two CUT-OFF controls to obtain the slightly lighted horizontal line in the same levels of three colours (red, green and blue).The line looks like white if the CUT-OFF controls are adjusted properly.
c. Delete the connection of CN201.
d. Adjust the blue and green drive controls to obtain the proper white-balanced picture in high light areas.
e. Set the contrast control to the minimum position and turn the brightness control slightly counter-clockwise to obtain a dark gray raster. Then check the white balance in low brightness. If the white balance is not enough, repeat the steps (a - e) for correct white balance.

14. CONVERGENCE ADJUSTMENT

Note: Before attempting any convergence adjustment, the receiver should be operated at least for fifteen minutes.

1) Centre Convergence Adjustment

a. Receive crosshatch pattern with a colour bar signal generator.
b. Adjust the BRIGHTNESS and CONTRAST Controls for a well defined pattern.
c. Adjust the two tabs of the 4-pole Magnets to change the angle between them (See Fig. 3) and superimpose the red and blue vertical lines in the centre area of the picture screen (See Fig. 3).
d. Turn the both taps while at the same time keeping the angle constant and superimpose the red and blue horizontal lines at the centre of the screen (See Fig. 4).
e. Adjust two tabs of 6-pole Magnets to superimpose red/blue line and green one. Adjusting the angle affects the horizontal lines.
f. Due to the interaction between these adjustments, steps c, d and e should be repeated until the satisfactory results are obtained.

2) Circumference Convergence Adjustment

a. Loosen the clamping screw of deflection yoke to allow the yoke to tilt.
b. Put a wedge as shown in Fig. 2 temporarily (Do not remove cover paper on adhesive part of the wedge).
c. Tilt the front of the deflection yoke up or down to obtain the better convergence in circumference (See Fig. 4). Push the mounted wedge into the space between the picture tube and yoke to fix the yoke temporarily.
d. Put other wedge into the bottom space and remove the cover paper to stick.
e. Tilt the front of the yoke right or left to obtain the better convergence in circumference (See Fig. 4).
f. Keep the yoke position and another wedge in either upper space. Remove the cover paper and stick the wedge on picture tube to fix the yoke.
g. Detach the temporarily mounted wedge and put it in another upper space. Stick it on this picture tube to fix the yoke.
h. After fixing three wedges, recheck overall convergence. Tighten the screw firmly to fix the yoke and check if the yoke is firm.
i. Stick 3 adhesive tabs on the wedges as shown in Fig. 2.

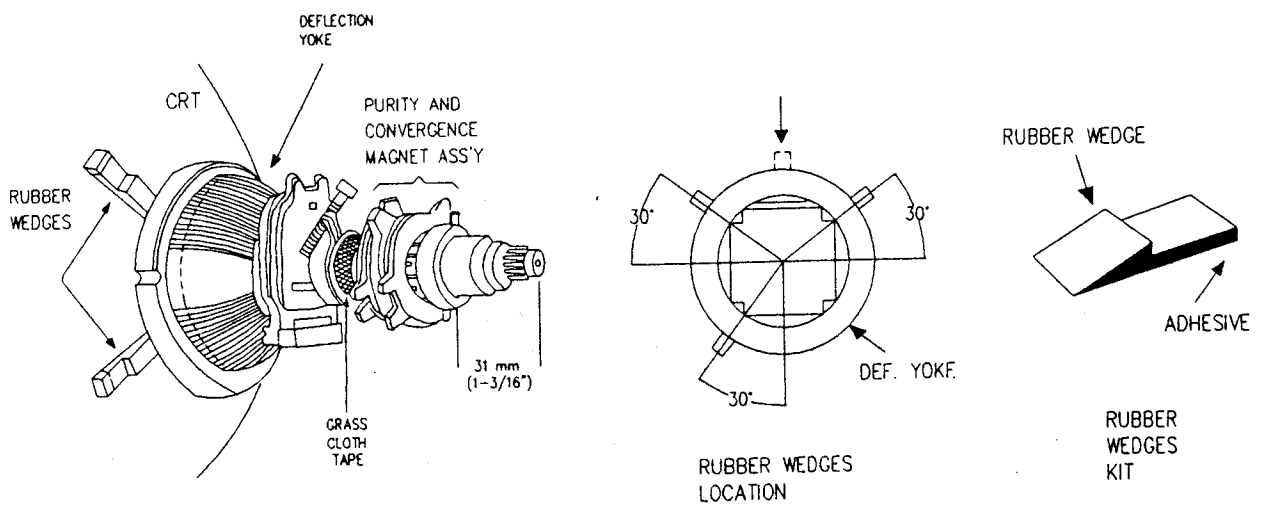


Figure 2. Tube Assembly

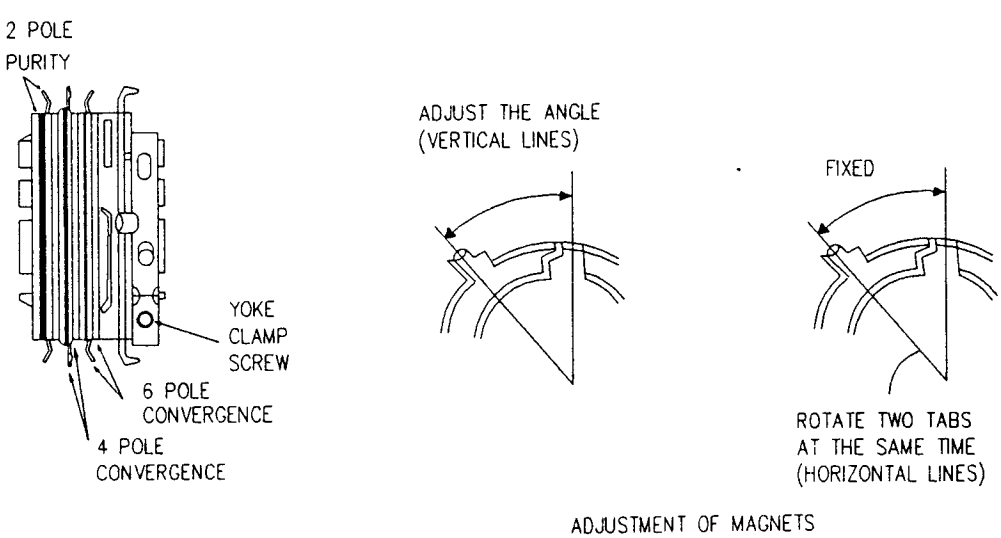
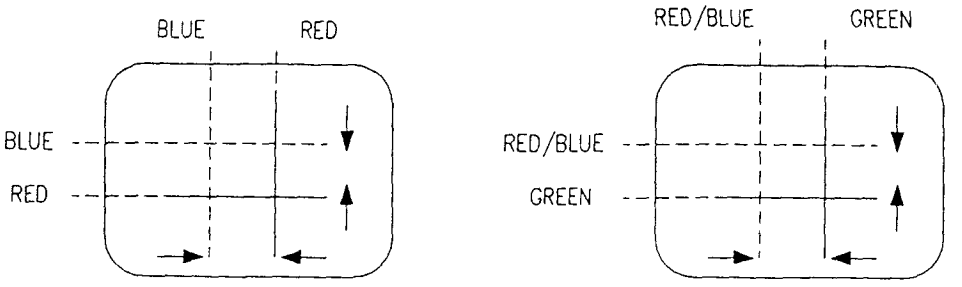
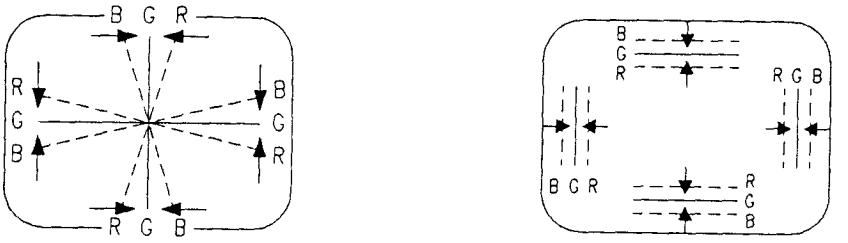


Figure 3. Purity and Convergence Magnets



4-POLE MAGNETS MOVEMENT 6-POLE MAGNETS MOVEMENT

Centre Convergence by Convergence Magnets



INCLINE THE YOKE UP (OR DOWN) INCLINE THE YOKE RIGHT (OR LEFT)

Circumference Convergence by DEF. Yoke

Figure 4. Dot Movement Instructions

4. GENERAL ALIGNMENT INSTRUCTIONS

A.GENERAL

The alignment is an exacting procedure and should be undertaken only when necessary.
The test equipment specified or its equivalent is required to properly perform the alignment procedures which are outlined on the following pages. The use of equipment which does not meet these requirements may result in the inability to properly align the receiver.
It is essential that bias values as specified are maintained while the alignment to insure proper results.

B. EQUIPMENT TERMINATIONS

The alignment pads are designed for correct matching of the equipment to the circuits involved. The failure to the proper matching will result in representing the ture operation of the receiver.
The pads should be constructed as compactly as possible with all unshielded leads not being in excess of 2.5cm long.

C. SIGNAL

Since the large excessive of the sweep generator causes the overloading of receiver circuits, first, the output of the sweep generator set to zero and then gradually increase the output until a response is obtained.
Further increase changes in configuraton, for example, flattening at the top or dropping below the base line at the bottom, decrease the sweep output to restore the proper configuration.
The oscilloscope gain should be as high as possible to maintain a useable pattern with the peak-to-peak values specified, thus requiring a lower output from the sweep generator and less change of overload.
Insertion of makers from the marker generator should not cause the distortion of the response.

D. TEST EQUIPMENTS

1) PAL PATTERN GENERATOR (PM5518)
2) OSCILLOSCOPE
3) DC POWER SUPPLY (DC range:0-10V,0-20V)
4) MATCHING PAD
5) PROBE (which impedance is 75 ohm)
6) DIGITAL VOLTMETER
7) BNC TO DIN JACK
8) BNC TO BNC CABLE

1. VIF (AFT) ALIGNMENT

1) Equipment

a. Pattern generator (PM5518)
b. DC power supply
c. Digital Voltmeter

2) Setting

a. PM5518: Multiburst pattern 38.9MHz
b. DC power supply: 12V
c. Digital Voltmeter: 10V range

3) Preparation

a. Connect DC power supply to TP-12 of the Main PCB.
b. Connect Digital Voltmeter to TP-18 of the Main PCB.
c. Connect RF out of PM5518 to TP-IF of the main PCB.

4) Step

Adjust the T101 until the Digital Voltmeter is to be 6V.

2. SOUND (6.0MHz DET) ALIGNMENT

1) Equipment

Digital Voltmeter

2) Setting

Digital Voltmeter: 12V range

3) Preparation

a. Receive the colour bar pattern and insert 1KHz modulated Sound Carrier
b. Connect the Digital Voltmeter to AU-OUT

4) Step

a. Adjust the T601 until the Digital Voltmeter is to be 3.8 – 4V

3. PAL COLOUR MATRIX ADJUSTMENT

1) The Using Measurer

Oscilloscope (10:1 PROBE)

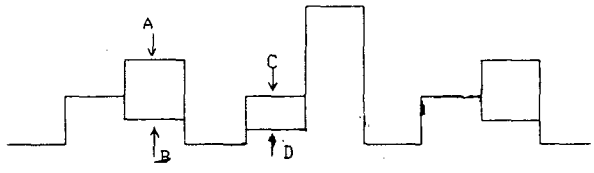
2) The Adjustment Preparation

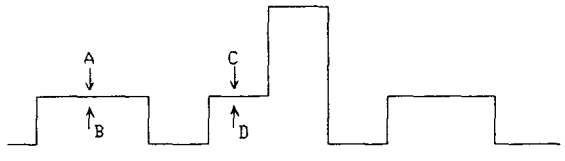
a. Receive the PAL colour demodulator pattern.
b. Connect the oscilloscope to pin 16 of PWB Main Board IC501 (TDA3561A).
c. Set the Colour, Contrast Max, Bright to the proper brightness.

3) The Adjustment

a. By turning VR501, make A consistent with B.
b. By turning T501, make C consistent with D.

Before





After

4. QUADRATURE REFERENCE (DR/DB)

1) The Using Measurer

Oscilloscope (10:1 PROBE)

2) The Applicaion Preparation

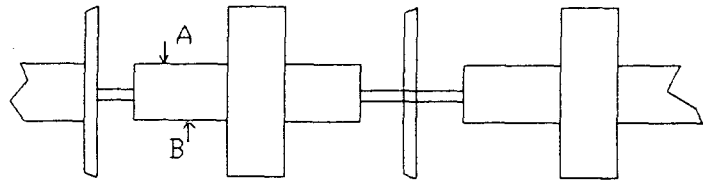
a. Receive the SECAM Philips Pattern.
b. Connect the oscilloscope probe to pin 14 of the PWB Main Board ICS502 (TDA3590A).
c. Set the Colour/Contrast Max, Bright to the proper brightness.
Set VRS01 to the center.

3) The Adjustment

a. By adjusting TS02, make B-Y line consistent with REF LEVEL.
b. Move the oscilloscope probe to pin 13 of IC502.
c. By adjusting VR502 clockwise, make R-Y line consistent with REF LEVEL.

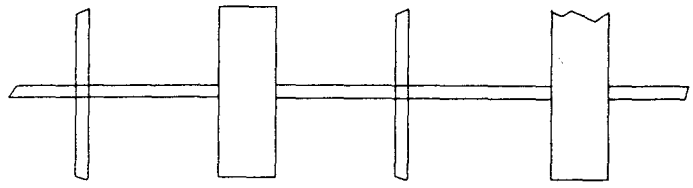
Before

Reference Level



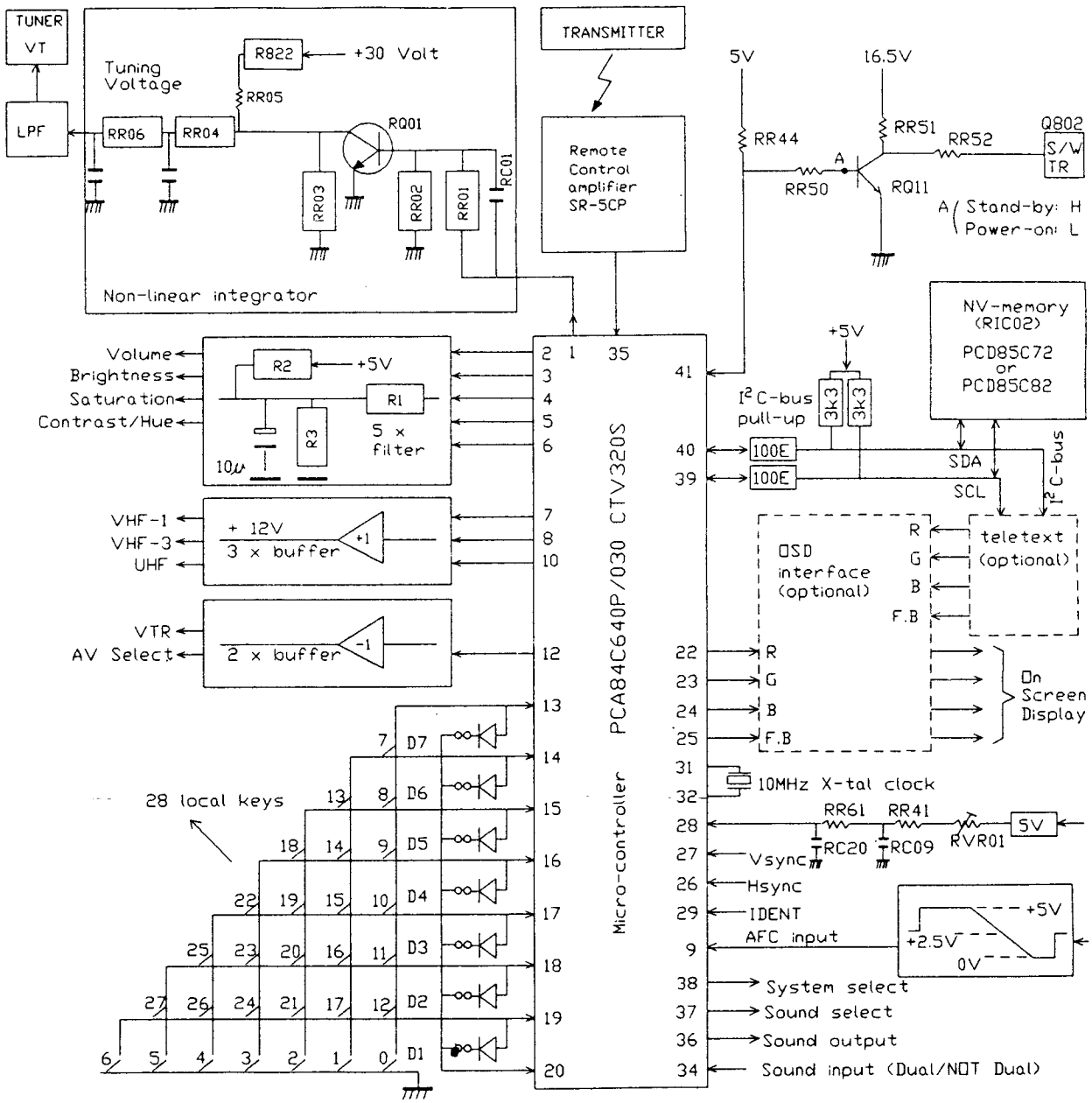
After

Reference Level



5. RM-109 REMOCON FEATURES

1. THE ILLUSTRATION OF RM-109 SYSTEM BLOCK



2. MICRO-CONTROLLER (PCA84C640P/030) TERMINALS DESCRIPTION

No.	Description	Function	No.	Description	Function
1	VTUNN	tuning voltage control output	10	UHF	band-switch UHF output
2	VOL	volume control output	11	VTR	VTR time contrast control output
3	BRI	brightness control output	12	AV	ext./int./Audio/Video source control output
4	SAT	saturation control output			
5	CON/HUE	contrast or hue control output	13	KEYB0	keyboard scan line input/output
6	BAL/TON/HUE	balance,tone or hue control output	14	KEYB1	keyboard scan line input/output
7	VHF-L	band-switch VHF-low output	15	KEYB2	keyboard scan line input/output
8	VHF-H	band-switch VHF-high output	16	KEYB3	keyboard scan line input/output
9	AFC	analogue AFC sense input	17	KEYB4	keyboard scan line input/output

No.	Description	Function	No.	Description	Function
18	KEYB5	keyboard scan line input/output	33	RESETN	power-on reset input/output
19	KEYB6	keyboard scan line input/output	34	SNDI	dual/non dual language sound input
20	MDSTR	system mode strobe output	35	RMOT	remote control input
21	Vss	ground supply input	36	SNDO	sound mode select output
22	RED	OSD red output			Language 1/2 control output
23	GREEN	OSD green output			Stereo/mono control output
24	BLUE	OSD blue output	37	EFFECT	Sound effect control output
25	FBL	OSD fast blanking output	38	SYSTEM	PAL/SECAM system standard control output
26	H-SYNC	horizontal synchronization input			SECAM-L/L' depends on VHF-L output
27	V-SYNC	vertical synchronization input			PAL/NTSC system standard control output
28	DOSC	RC oscillator input for OSD	39	SCL	I^2C-bus clock signal input/output
29	IDENT	horizontal coincidence input	40	SDA	I^2C-bus data signal input/output
30	TEST	test input; connected to ground	41	STDBY	Standby/On control input/output
31	X-TAL1	oscillator input; 10MHz crystal	42	Vdd	+5V supply voltage input
32	X-TAL2	oscillator output			

Note :
These pins are read at 'cold start', they define the configuration/options of the TV-system controlled by CTV320S. These pins can command a solenoid to switch-off AC-mains supply.

6. TDA4601 (IC801) SPECIFICATION

The integrated circuit TDA4601 or-D is designed for regulating controlling and protecting the switching transistor installed in the flyback converter power supplies. It also protects the complete SMPS by preventing an increase in the secondary voltage in case of errors. In addition to their use with TV receivers and video recorders, these ICs can be applied in power supplies of Hi-Fi sets and active speakers due to their wide operational ranges and supperior voltage stability during high load change.

1. Features

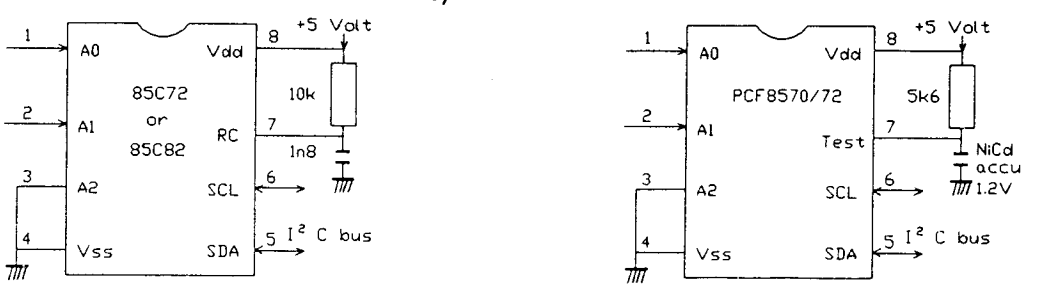
- Direct control of switching transistor
- Low start-up current
- Reversing linear overload characteristic
- Collector current proportional to base-current input
- Protective circuit in the event of errors.

2. Pin description

No	Function
1	Vref output
2	Zero-passage identification
3	Input regulating amplifier,overload amplifier
4	Collector-current simulation
5	Possible connection for additional RLD0 protective circuit
6	Ground (rigidly connected to substrate RLD0 mounting plate)
7	DC voltage output for charging the RLD0 coupling capacitor
8	Pulse output, driving the switching RLD0 transistor
9	Power supply

7. NON-VOLATILE MEMORY

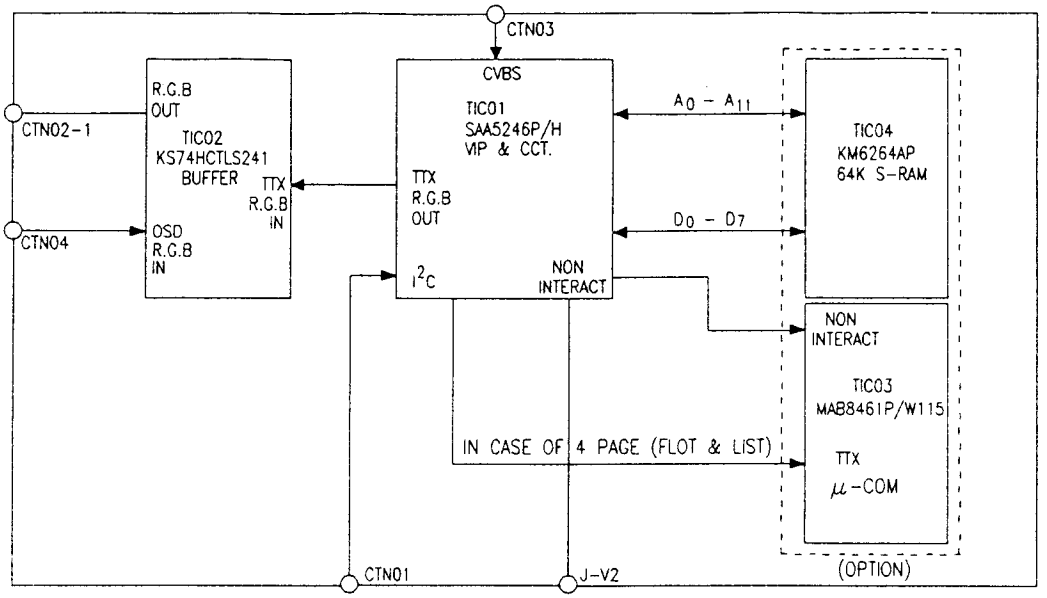
The CTV320s tuning and sound system requires 128 bytes non-volatile memory (EEPROM PCF8581A or CMOS PCF2). With such a memory the system is able to store up 40 "pre-selected" programs, the video and sound control values (option 9a). The number of programs can be extended to 90 (option 9b) by using a 256 bytes memory (EEPROM PCF8582A or CMOS PCF8570).



Application of CMOS and EEPROM non-volatile memory in CTV320S.

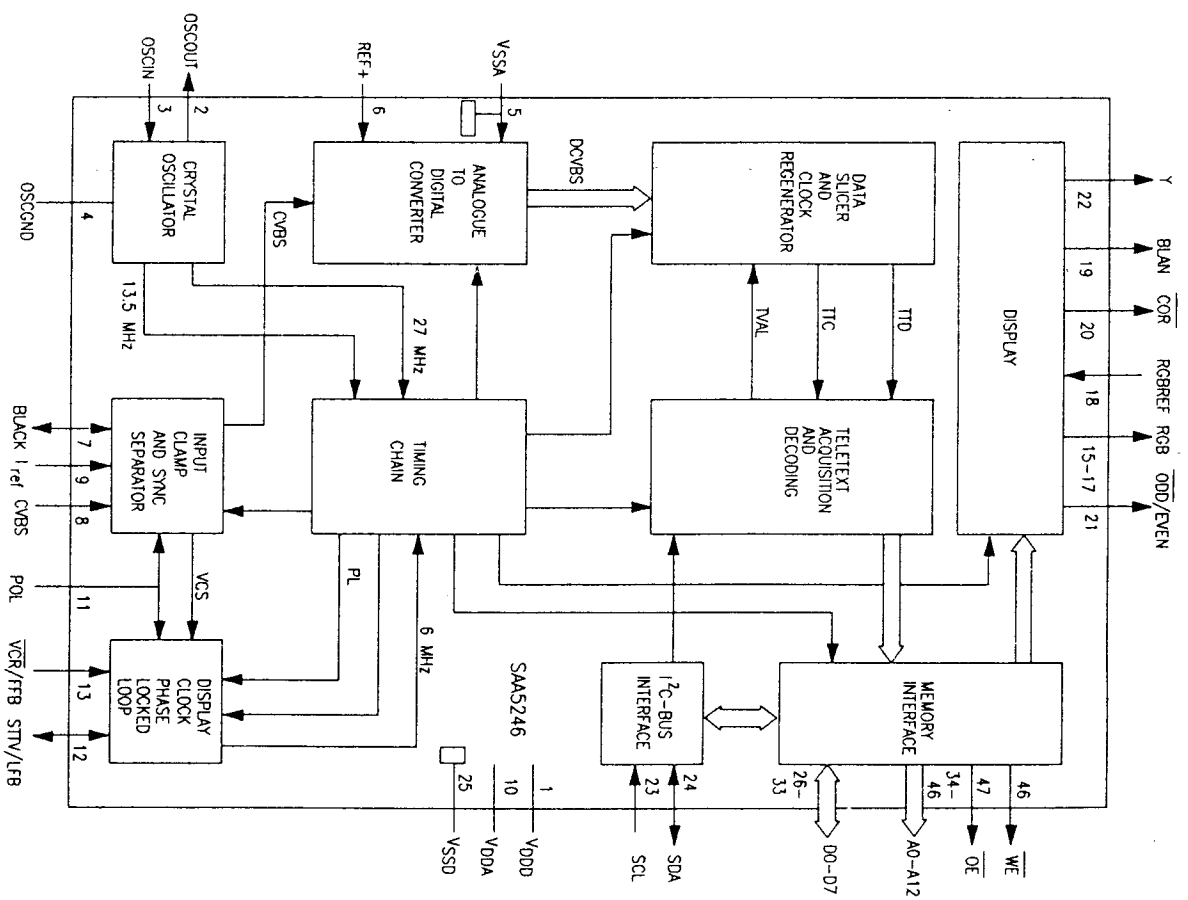
8. TELETEXT SECTION

1. THE ILLUSTRATION SYSTEM BLOCK



2. INTERNAL BLOCK DIAGRAM (SAA5246P/H)

SAA5246P/H



3. TERMINALS DESCRIPTION (SAA5246P/H)

Pin no.	Description	Function
1	V_{DDD}	+5 V supply to the digital sections of the device.
2	OSCOUT	27MHz crystal oscillator output.
3	OSCIN	27MHz crystal oscillator input.
4	OSCGND	Crystal oscillator ground 0 V.
5	V_{SSA}	Analogue ground 0 V.
6	REF+	Positive reference voltage for the ADC. If necessary, the pin should be connected to analogue +5 V via decoupling components.
7	BLACL	Video black level storage pin, connected to analogue ground via a 100μF capacitor.
8	CVBS	Composite video input pin. A positive-going 1 V peak-to-peak input is required, connected via a 100μF capacitor.
9	I_{ref}	Reference current input pin, connected to analogue ground via a 27kΩ resistor.
10	VDDA	+5 V supply to the analogue sections of the device.
11	POL	STTV/LFB/FFB polarity select pin.
12	STTV/LFB	Sync to TV output pin/line flyback input pin. Function controlled by an internal register bit.
13	$\overline{VCR}$/FFB	PLL time constant switch/field flyback input pin. Function controlled by an internal register bit.
14	V_{SSD}	Connected to VSSD for normal operation.
15	R	Dot rate character output of the RED colour information.
16	G	Dot rate character output of the GREEN colour information.
17	B	Dot rate character output of the BLUE colour information.
18	RGBREF	DC voltage to define the output high level on the RGB pins.
19	BLAN	Dot rate fast blanking output. HIGH for text and LOW for picture.
20	$\overline{COR}$	Programmable output to provide constant reduction of the TV picture for mixed text and picture displays or when viewing newsflash/subtitle pages. Open drain output.
21	$\overline{ODD}$/EVEN	25Hz output synchronized with the CVBS input's field sync pulses to produce a non-interaced display by adjustment of the vertical deflection currents.
22	Y	Dot rate character output of teletext foreground colour information. Open drain output.
23	SCL	Serial clock input for I2C-bus. It can still be driven HIGH during power-down of the device.
24	SDA	Serial data port for the I2C-bus. Open drain output. It can still be driven HIGH during power-down of the device.
25	V_{SSD}	Digital ground 0 V.
26 - 33	D0 - D7	Data lines for the page RAM.
34 - 46	A0 - A12	Address lines for the page RAM.
47	$\overline{OE}$	Output enable to the page RAM.
48	$\overline{WE}$	Write enable to the page RAM.

PRODUCT SAFETY NOTICE

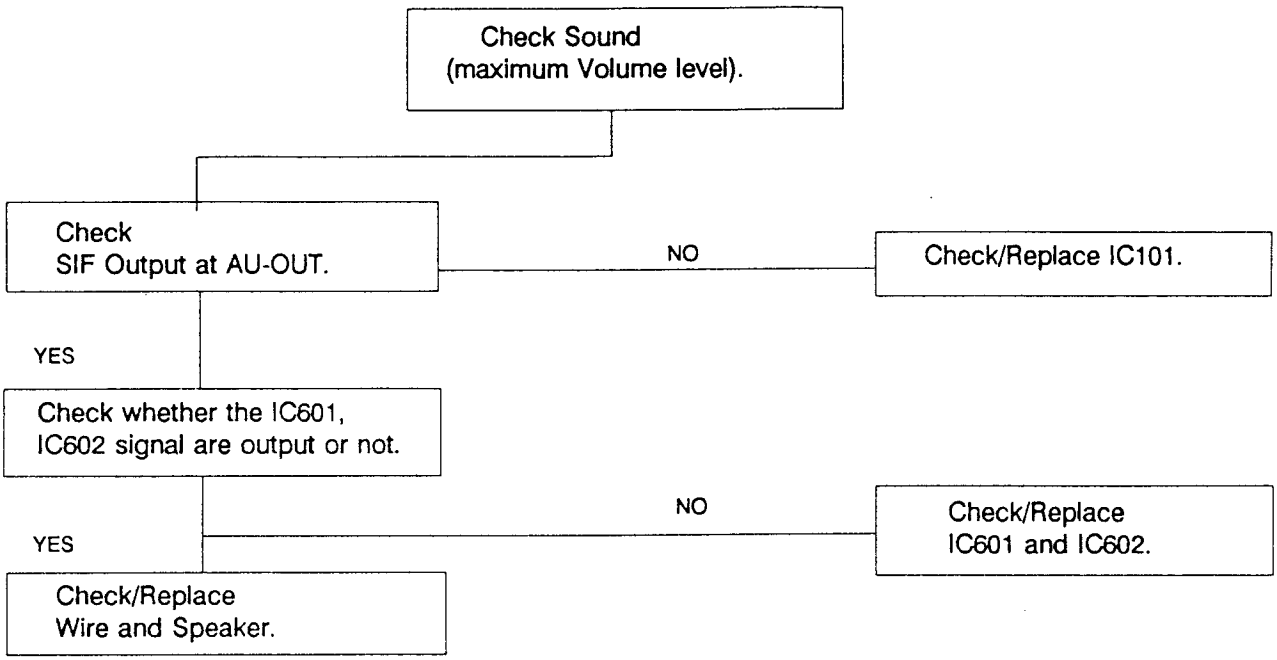
Many electrical and mechanical parts in this chassis have special safety-related characteristics. These characteristics are often passed unnoticed by visual inspection and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. The replacement parts which have these special safety characteristics are identified in this manual and its supplements; electrical components having such features are identified by shading on the schematic diagram and the parts list. Before replacing any of these components, read the parts list in this manual carefully. The use of subsititute parts which do not have the same safety characteristics in the parts list may create a shock, fire,X- radiation or other hazards.

SERVICE NOTES

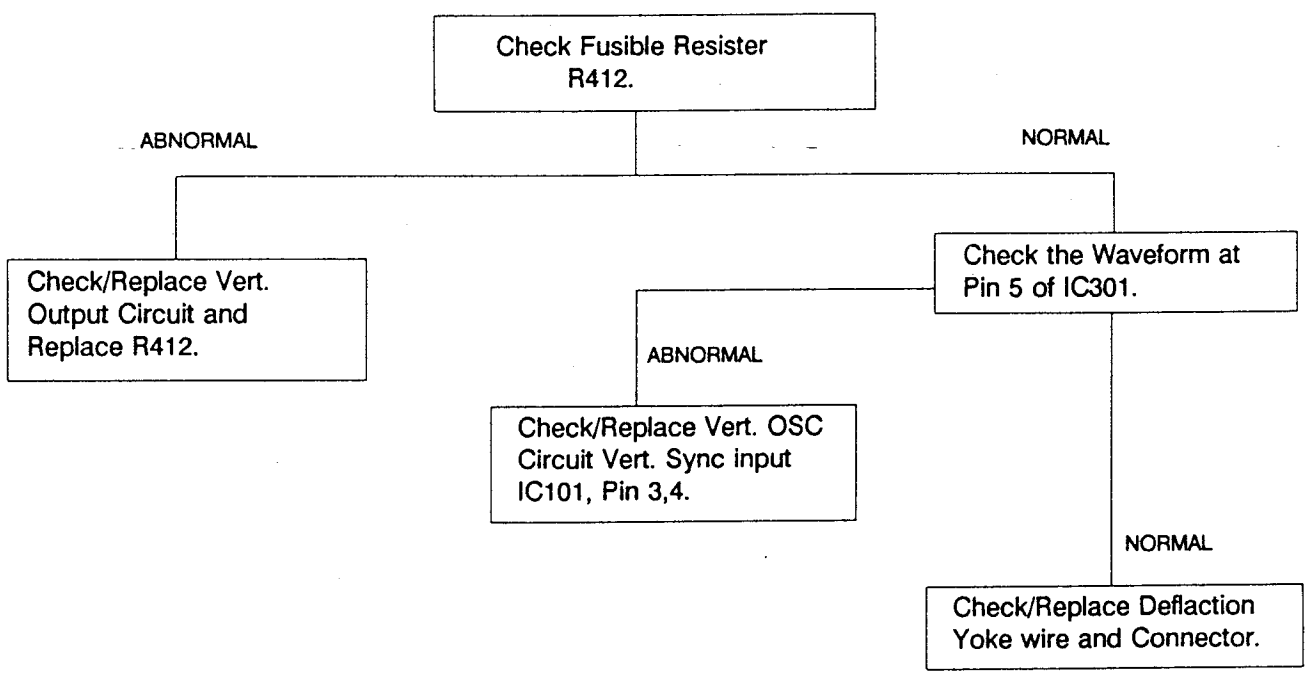
1. When replacing the parts or the circuit boards, clamp the lead wires to the terminals before soldering.
2. When replacing a high wattage resistor (oxide metal film resistor) in the circuit board, keep the resistor 10mm (1/2 in) away from the circuit board.
3. Keep the wires away from high voltage or high temperature components.
4. If any fuse in this TV receiver is blown, replace it with the FUSE specified in the chassis parts list.

 The lighting flash and arrowhead within the triangle is a warning sign alerting you of "dangerous voltage" inside the product.	CAUSION RISK OF ELECTRIC SHOCK DO NOT OPEN **CAUTION** : To reduce the risk of electric shock, do not remove cover (or back) no user serviceable parts inside. Refer servicing to qualified service personnel.	 The exclamation point within the triangle is a warning sign alerting you of important instructions accompanying the product.

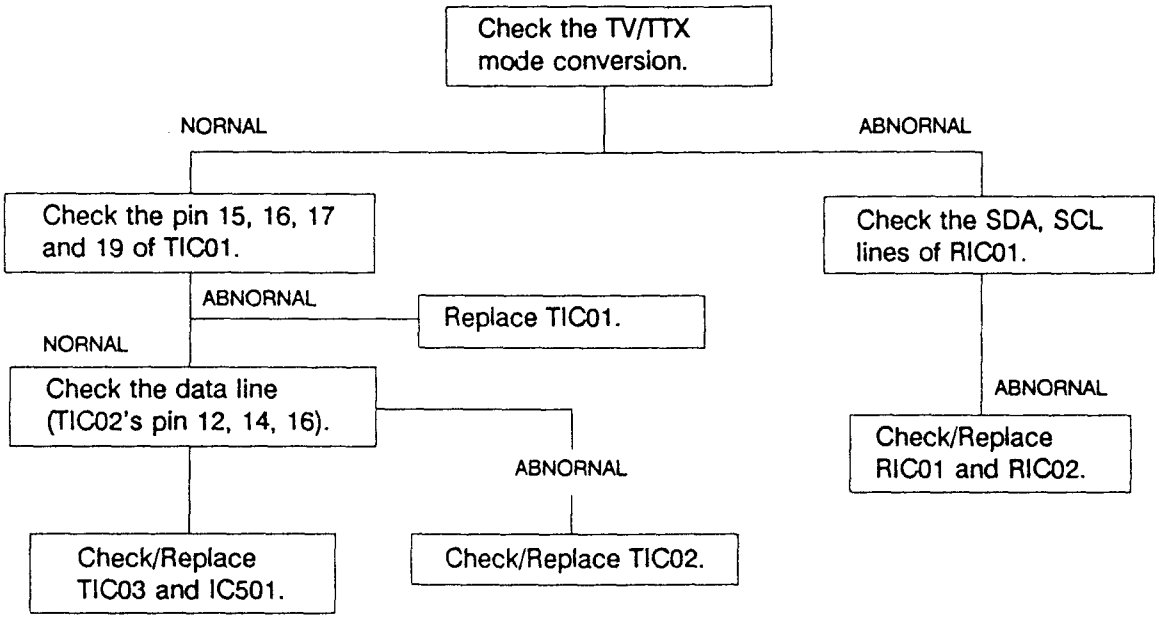
NO SOUND (PICTURE OK)



NO VERT SCAN (ONE HORIZ.LINE RASTER)

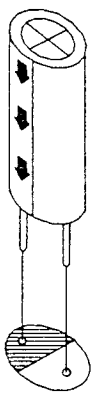


NO TELETEXT

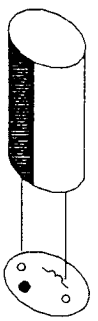

Check the TV/TTX mode conversion.
NORNAL
ABNORNAL
Check the pin 15, 16, 17 and 19 of TIC01.
Check the SDA, SCL lines of RIC01.
ABNORNAL
Replace TIC01.
NORNAL
Check the data line (TIC02's pin 12, 14, 16).
ABNORNAL
Check/Replace RIC01 and RIC02.
Check/Replace TIC03 and IC501.
Check/Replace TIC02.

10. INSERTING FORM OF THE IMPORTANT PARTS

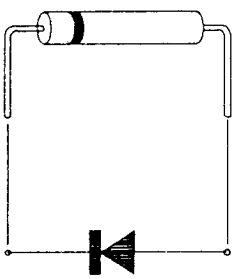
ELECTROLYTIC-CONDENSER



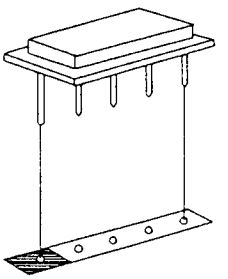
COIL-LINEARITY



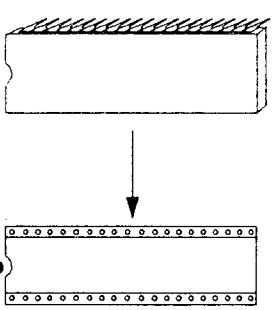
DIODE



SAW FILTER



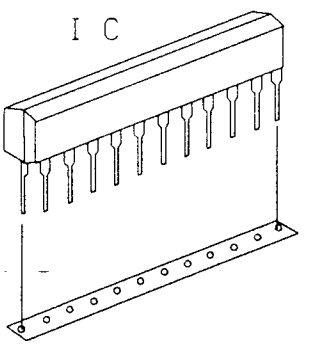
I C



TDA3651A
TDA3590A
PCA84C640P/019 or 030
TDA8305
CD4066BCN
85C72
KA2186

SAA5246P/E
PCF84C81P/039
KS74HCTLS241
KM5246P/E
} TTX OPTION

I C



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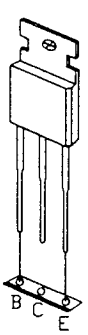
TDA4601
KA2131

TRANSISTOR



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BU508AF
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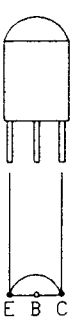
2SD1650D
2SC3552-Y

TRANSISTOR



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KSC2331-Y
KSC815-Y
KSA539-Y
KSA940
KSA6420
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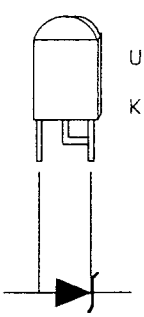
TRANSISTOR



UPC574J
or
KA33V

11. CHASSIS REPLACEMENT PARTS LIST

ABBREVIATIONS :

CC	C-CERAMIC	RC	R-COMPOSITION
CE	C-ELECTROLYTIC	RD	R-CARBON
CFS	C-M,POLYESTER	RF	R-FUSIBLE
CK	C-CERAMIC,HK	RM	R-METAL,FILM
CQ	C-POLYPROPYLENE,POLYESTE	RP	R-CEMENT WIRE
CS	C-TANTALIUM,SOLID	RS	R-METAL,OXIDE

NOTE : The items with "*" are usually out of stock since they are seldom required for the routine service. There may be some anticipated delay when you order these items.

S.N.A. = Service Not Available , L/C = Local Purchase

The components identified by mark '**' are critical for safety. Replace only with Supplier part number specified.

When indicating parts by location number, Please inciude the PWB names (PWB = Printed Writing Board)

Loc No	Supplier Parts No.	Specification	
	A S S Y - P W B M A I N		
	*3T30-01382-060 CT2125UK/AKAIX		
PWB	33004-145-601	P58S(H)	<S.N.A>
	RESISTORS		
MR001	31018-377-122	RD 1/2T 1.2K-J	
MR002	31018-377-122	RD 1/2T 1.2K-J	
R101	31018-177-120	RD 1/8T 12-J	
R102	31018-177-470	RD 1/8T 47-J	
R103	31018-177-122	RD 1/8T 1.2K-J	
R104	31018-177-472	RD 1/8T 4.7K-J	
R105	31018-177-101	RD 1/8T 100-J	
R107	31018-177-100	RD 1/8T 10-J	
R108	31018-177-122	RD 1/8T 1.2K-J	
R110	31018-177-472	RD 1/8T 4.7K-J	
R111	31018-177-223	RD 1/8T 22K-J	
R112	31018-177-182	RD 1/8T 1.8K-J	
R113	31018-177-332	RD 1/8T 3.3K-J	
R114	31018-177-224	RD 1/8T 220K-J	
R115	31018-177-224	RD 1/8T 220K-J	
R116	31018-177-124	RD 1/8T 120K-J	
R118	31018-177-101	RD 1/8T 100-J	
R121	31018-177-159	RD 1/8T 1.5-J	
R122	31018-177-472	RD 1/8T 4.7K-J	
R123	31018-177-472	RD 1/8T 4.7K-J	
R124	31018-177-333	RD 1/8T 33K-J	
R202	31018-177-221	RD 1/8T 220-J	
R204	31018-177-202	RD 1/8T 2K-J	
R205	31018-177-102	RD 1/8T 1K-J	
R206	31018-177-750	RD 1/8T 75-J	
R207	31018-177-910	RD 1/8T 91-J	
R208	31018-177-222	RD 1/8T 2.2K-J	
R209	31018-377-102	RD 1/2T 1K-J	
R210	31018-376-124	RD 1/2T 120K-G	
**R302	31048-354-703	RM 1/2T 470K-F(S)	
R303	31018-177-332	RD 1/8T 3.3K-J	

Loc No	Supplier Parts No.	Specification
R304	31018-377-681	RD 1/2T 680-J
R305	31018-177-203	RD 1/8T 20K-J
R306	31018-377-159	RD 1/2T 1.5R-J
R307	31018-177-333	RD 1/8T 33K-J
R308	31018-177-183	RD 1/8T 18K-J
R309	31018-377-271	RD 1/2T 270-J
R310	31018-177-153	RD 1/8T 15K-J
R311	31018-177-224	RD 1/8T 220K-J
R312	31018-177-222	RD 1/8T 2.2K-J
R401	31018-177-154	RD 1/8T 150K-J
**R402	31048-176-303	RM 1/8T 30K-G
R403	31018-177-182	RD 1/8T 1.8K-J
R404	31018-177-824	RD 1/8T 820K-J
R405	31018-177-272	RD 1/8T 2.7K-J
R406	31018-177-220	RD 1/8T 22-J
R407	31018-377-224	RD 1/2T 220K-J
R408	31018-177-333	RD 1/8T 33K-J
R409	31018-177-753	RD 1/8T 75K-J
R410	31018-177-271	RD 1/8T 270-J
R411	31018-377-680	RD 1/2T 68-J
**R412	31059-002-010	RF 1/2P 1-J
**R414	31046-467-151	RS 1T 150-J (AUTO)
**R415	31046-467-102	RS 1T 1K-J (AUTO)
R416	31018-377-683	RD 1/2T 68K-J
R417	31018-177-563	RD 1/8T 56K-J
R501	31018-177-512	RD 1/8T 5.1K-J
R502	31018-177-152	RD 1/8T 1.5K-J
R503	31018-177-102	RD 1/8T 1K-J
R504	31018-177-751	RD 1/8T 750-J
R505	31018-177-471	RD 1/8T 470-J
R506	31018-177-103	RD 1/8T 10K-J
R507	31018-177-102	RD 1/8T 1K-J
R508	31018-177-561	RD 1/8T 560-J
R509	31018-177-112	RD 1/8T 1.1K-J
R510	31018-177-750	RD 1/8T 75-J
R511	31018-177-750	RD 1/8T 75-J
R512	31018-177-750	RD 1/8T 75-J
R513	31018-177-750	RD 1/8T 75-J
R514	31018-177-750	RD 1/8T 75-J

Loc No	Supplier Parts No.	Specification
R515	31018-177-750	RD 1/8T 75-J
R517	31018-177-102	RD 1/8T 1K-J
R518	31018-177-621	RD 1/8T 620-J
R519	31018-177-750	RD 1/8T 75-J
R520	31018-377-124	RD 1/2T 120K-J
R521	31018-177-561	RD 1/8T 560-J
R522	31018-177-242	RD 1/8T 2.4K-J
R523	31018-177-911	RD 1/8T 910-J
R524	31018-177-511	RD 1/8T 510-J
R527	31018-177-620	RD 1/8T 62-J
R528	31018-177-159	RD 1/8T 1.5-J
R601	31018-177-221	RD 1/8T 220-J
R602	31018-177-681	RD 1/8T 680-J
R603	31018-177-472	RD 1/8T 4.7K-J
R604	31018-177-132	RD 1/8T 1.3K-J
R605	31018-177-182	RD 1/8T 1.8K-J
R606	31018-177-121	RD 1/8T 120-J
R607	31018-177-102	RD 1/8T 1K-J
R608	31018-177-202	RD 1/8T 2K-J
R609	31018-177-103	RD 1/8T 10K-J
R610	31018-177-750	RD 1/8T 75-J
R611	31018-177-750	RD 1/8T 75-J
R612	31018-177-103	RD 1/8T 10K-J
R613	31018-177-103	RD 1/8T 10K-J
R614	31018-177-752	RD 1/8T 7.5K-J
R615	31018-177-822	RD 1/8T 8.2K-J
R616	31018-177-104	RD 1/8T 100K-J
R617	31018-177-224	RD 1/8T 220K-J
R618	31018-177-562	RD 1/8T 5.6K-J
R619	31018-177-203	RD 1/8T 20K-J
**R620	31046-567-339	RS 2T 3.3-J(AUTO)
R621	31018-377-479	RD 1/2T 4.7-J
R622	31018-177-202	RD 1/8T 2K-J
R623	31018-177-103	RD 1/8T 10K-J
R625	31018-177-103	RD 1/8T 10K-J
R626	31018-177-103	RD 1/8T 10K-J
R627	31018-177-222	RD 1/8T 2.2K-J
R701	31018-177-333	RD 1/8T 33K-J
R702	31018-177-333	RD 1/8T 33K-J
R704	31018-177-104	RD 1/8T 100K-J
R705	31018-177-124	RD 1/8T 120K-J
R708	31018-177-203	RD 1/8T 20K-J
R709	31018-177-273	RD 1/8T 27K-J
R720	31018-177-103	RD 1/8T 10K-J
**R801	31039-687-569	RW 7H 5.6-J
**R802	31049-317-104	RS 3P 2.7K-J
**R803	31046-567-154	RS 2T 150K-J(AUTO)
R804	31018-177-221	RD 1/8T 220-J
R805	31018-177-122	RD 1/8T 1.2K-J
R806	31018-177-103	RD 1/8T 10K-J
R807	31018-177-113	RD 1/8T 11K-J
**R808	31046-567-101	RS 2T 100-J(AUTO)
**R809	31046-467-274	RS 1T 270K-J (AUTO)
R811	31018-177-104	RD 1/8T 100K-J
R812	31018-377-688	RD 1/2T 0.68-J
R813	31018-177-101	RD 1/8T 100-J
**R814	31039-586-390	RW 5J 39-J

Loc No	Supplier Parts No.	Specification
**R815	31028-328-475	RC 1/2P 4.7M-K
**R816	31028-328-475	RC 1/2P 4.7M-K
**R821	31046-567-333	RS 2T 33K-J(AUTO)
**R822	31046-567-153	RS 2T 15K-J(AUTO)
**R823	31046-567-220	RS 2T 22-J(AUTO)
**R824	31046-567-101	RS 2T 100-J(AUTO)
**R825	31059-002-130	RF 1/2P 0.47-K
**R829	31059-002-130	RF 1/2P 0.47-K
**R830	31046-567-220	RS 2T 22-J(AUTO)
**R831	31028-328-334	RC 1/2T 330K-K
**R832	31039-586-560	RW 5J 56-J
R901	31018-177-221	RD 1/8T 220-J
R902	31018-177-221	RD 1/8T 220-J
R903	31018-177-221	RD 1/8T 220-J
R904	31018-177-102	RD 1/8T 1K-J
R905	31018-177-102	RD 1/8T 1K-J
R906	31018-177-102	RD 1/8T 1K-J
R907	31018-177-242	RD 1/8T 2.4K-J
R908	31018-177-102	RD 1/8T 1K-J
R909	31018-377-151	RD 1/2T 150-J
R910	31018-177-331	RD 1/8T 330-J
R911	31018-377-680	RD 1/2T 68-J
R912	31018-377-683	RD 1/2T 68K-J
R913	31018-377-683	RD 1/2T 68K-J
R914	31018-377-683	RD 1/2T 68K-J
**R915	31046-567-153	RS 2T 15K-J(AUTO)
**R916	31046-567-153	RS 2T 15K-J(AUTO)
**R917	31046-567-153	RS 2T 15K-J(AUTO)
**R918	31028-328-472	RC 1/2T 4.7K-K
**R919	31028-328-472	RC 1/2T 4.7K-K
**R920	31028-328-472	RC 1/2T 4.7K-K
**R921	31059-004-019	RF 2P 1.9-J
RP501	31018-177-821	RD 1/8T 820-J
RP502	31018-177-102	RD 1/8T 1K-J
RR01	31018-177-392	RD 1/8T 3.9K-J
RR02	31018-177-103	RD 1/8T 10K-J
RR03	31018-177-683	RD 1/8T 68K-J
RR04	31018-177-153	RD 1/8T 15K-J
RR05	31018-177-103	RD 1/8T 10K-J
RR06	31018-177-103	RD 1/8T 10K-J
RR07	31018-177-472	RD 1/8T 4.7K-J
RR08	31018-177-681	RD 1/8T 680-J
RR10	31018-177-102	RD 1/8T 1K-J
RR11	31018-177-202	RD 1/8T 2K-J
RR12	31018-177-512	RD 1/8T 5.1K-J
RR14	31018-177-511	RD 1/8T 510-J
RR15	31018-177-132	RD 1/8T 1.3K-J
RR16	31018-177-471	RD 1/8T 470-J
RR17	31018-177-102	RD 1/8T 1K-J
RR18	31018-177-202	RD 1/8T 2K-J
RR19	31018-177-302	RD 1/8T 3K-J
RR26	31018-177-124	RD 1/8T 120K-J
RR31	31018-177-333	RD 1/8T 33K-J
RR32	31018-177-222	RD 1/8T 2.2K-J
RR37	31018-177-181	RD 1/8T 180-J
RR38	31018-177-222	RD 1/8T 2.2K-J
RR39	31018-177-223	RD 1/8T 22K-J

Loc No	Supplier Parts No.	Specification
RR40	31018-177-181	RD 1/8T 180-J
RR41	31018-177-221	RD 1/8T 220-J
RR42	31018-177-181	RD 1/8T 180-J
RR43	31018-177-102	RD 1/8T 1K-J
RR44	31018-177-272	RD 1/8T 2.7K-J
RR45	31018-177-101	RD 1/8T 100-J
RR46	31018-177-101	RD 1/8T 100-J
RR47	31018-177-101	RD 1/8T 100-J
RR48	31018-177-101	RD 1/8T 100-J
RR49	31018-177-103	RD 1/8T 10K-J
RR50	31018-177-272	RD 1/8T 2.7K-J
**RR51	31046-567-271	RS 2T 270-J(AUTO)
RR52	31018-177-101	RD 1/8T 100-J
RR53	31018-177-332	RD 1/8T 3.3K-J
RR54	31018-177-332	RD 1/8T 3.3K-J
RR55	31018-177-222	RD 1/8T 2.2K-J
RR56	31018-177-223	RD 1/8T 22K-J
RR57	31018-177-221	RD 1/8T 220-J
RR58	31018-177-470	RD 1/8T 47-J
RR59	31018-177-223	RD 1/8T 22K-J
RR61	31018-177-101	RD 1/8T 100-J
RR62	31018-177-103	RD 1/8T 10K-J
RR63	31018-177-222	RD 1/8T 2.2K-J
RR64	31018-177-102	RD 1/8T 1K-J
RR65	31018-177-102	RD 1/8T 1K-J
RR66	31018-177-102	RD 1/8T 1K-J
RR67	31018-177-102	RD 1/8T 1K-J
RR68	31018-177-102	RD 1/8T 1K-J
RR69	31018-177-102	RD 1/8T 1K-J
RR70	31018-177-102	RD 1/8T 1K-J
RR71	31018-177-102	RD 1/8T 1K-J
	VARIABLE RESISTORS	
RVR01	31249-128-011	EVN-DJA A03 B500
VR101	31249-128-002	EVN-DJA A03 B20K
VR201	31249-128-011	EVN-DJA A03 B500
VR301	31249-128-004	EVN-DJA A03 B1K
VR303	31249-128-005	EVN-DJA A03 B5K
VR304	31249-128-005	EVN-DJA A03 B5K
VR401	31249-128-001	EVN-DJA A03 B10K
VR402	31249-128-008	EVN-DJA A03 B50K
VR501	31249-128-003	EVN-DJA A03 B2K
VR801	31249-128-005	EVN-DJA A03 B5K
VR901	31249-128-004	EVN-DJA A03 B1K
VR902	31249-128-004	EVN-DJA A03 B1K
VR903	31249-128-004	EVN-DJA A03 B1K
VR904	31249-128-005	EVN-DJA A03 B5K
VR905	31249-128-005	EVN-DJA A03 B5K
	CAPACITORS	
	31417-109-140	CK45 TAPG F 50V 103-Z
C101	31407-105-180	CC45(T) CH 50V 220-J
C103	31417-109-140	CK45 TAPG F 50V 103-Z
C104	31407-105-280	CC45(T) CH 50V 560-J
C104	31407-105-280	CC45(T) CH 50V 560-J
C105	31417-109-140	CK45 TAPG F 50V 103-Z
C106	31417-109-140	CK45 TAPG F 50V 103-Z

Loc No	Supplier Parts No.	Specification
C107	31607-401-500	CE04W TAPG 16V 470M-M(SG
C108	31417-109-140	CK45 TAPG F 50V 103-Z
C111	31607-402-230	CE04W TAPG 50V 3.3M
C112	31507-127-012	EVQB1 H 104J-F3/2E 63V 1
C113	31607-401-470	CE04W TAPG 16V 100M VENT
C116	31507-127-025	ECQ-V1H 334J Z3/2E 63V 3
C117	31507-127-008	ECQ B1 H 223J F3
C118	31507-127-011	ECQ B1H 683J F3/2E 63V 6
C119	31607-401-500	CE04W TAPG 16V 470M-M(SG
C120	31607-902-250	CE04W TAPG 50V 0.22M
C122	31607-402-070	CE04W TAPG 35V 22M
C124	31607-401-470	CE04W TAPG 16V 100M VENT
C125	31507-127-024	ECQ-V1H 224J Z3/2E 63V 2
C202	31417-109-140	CK45 TAPG F 50V 103-Z
C203	31607-402-530	CE04W TAPG 50V 0.47U-NP
C204	31607-401-470	CE04W TAPG 16V 100M VENT
C205	31607-402-530	CE04W TAPG 50V 0.47U-NP
C206	31507-127-008	ECQ B1 H 223J F3
C207	31507-127-025	ECQ-V1H 334J Z3/2E 63V 3
C208	31407-105-700	CC45(T) CH 50V 151-J
**C209	31519-003-020	CFS922M 400V 0.1-K
**C301	31519-101-110	DSR 50V 0.22U-J
C302	31507-127-003	ECQ B1 H 332J F3
C303	31507-127-011	ECQ B1H 683J F3/2E 63V 6
C304	31507-127-012	EVQB1 H 104J-F3/2E 63V 1
C305	31609-904-332	CE04W 25V 3300u
C306	31607-402-220	CE04W TAPG 50V 2.2M
C307	31607-402-290	CE04W TAPG 50V 100M-M(SG
C308	31607-402-480	CE04W TAPG 50V 47-W(+20-
C309	31607-402-250	CE04W TAPG 50V 10M
C310	31507-127-022	ECQ B1 H 513J F3
C313	31507-127-023	ECQ B1 H 122J F3
**C401	31519-101-100	DSR 50V 0.0027 U-J
C402	31607-402-240	CE04W TAPG 50V 4.7M
C403	31507-127-011	ECQ B1H 683J F3/2E 63V 6
C404	31417-104-270	CK45 TAPG B 50V 681-K
C405	31507-127-000	ECQ B1 H 102J F3
C407	31507-127-012	EVQB1 H 104J-F3/2E 63V 1
C408	31507-127-001	ECQ B1 H 152J F3
C409	31507-127-006	ECQ B1 H 103J F3
C410	31417-344-222	CK45 TAPG F 50V 222-Z
**C411	31519-400-005	CFS 922M 1600V 0.0072-J
C412	31417-767-331	CK45(T) B2KV 331-K
C414	31607-402-710	CE04W TAPG 35V 1000M-M
C416	31607-403-070	CE04W TAPG 100V 68M-M
C418	31607-403-450	CE04W TAPG 250V 1M
**C419	31509-335-190	CQ922M 200V 0.43M-J
C501	31507-127-012	EVQB1 H 104J-F3/2E 63V 1
C502	31607-401-510	CE04W TAPG 16V 1000U-M
C503	31417-104-400	CK45 TAPG B 50V 102-K
C504	31507-127-024	ECQ-V1H 224J Z3/2E 63V 2
C505	31507-127-008	ECQ B1 H 223J F3
C506	31407-105-660	CC45(T) CH 50V 101-J
C507	31407-105-660	CC45(T) CH 50V 101-J
C510	31607-402-220	CE04W TAPG 50V 2.2M
C511	31507-127-024	ECQ-V1H 224J Z3/2E 63V 2
C512	31607-402-240	CE04W TAPG 50V 4.7M

Loc No	Supplier Parts No.	Specification
C513	31607-402-480	CE04W TAPG 50V 47-W(+20-
C515	31507-127-012	EVQB1 H 104J-F3/2E 63V 1
C516	31607-402-240	CE04W TAPG 50V 4.7M
C517	31507-127-012	EVQB1 H 104J-F3/2E 63V 1
C518	31507-127-012	EVQB1 H 104J-F3/2E 63V 1
C519	31507-127-012	EVQB1 H 104J-F3/2E 63V 1
C520	31507-127-012	EVQB1 H 104J-F3/2E 63V 1
C521	31507-127-012	EVQB1 H 104J-F3/2E 63V 1
C522	31507-127-012	EVQB1 H 104J-F3/2E 63V 1
C523	31607-402-210	CE04W TAPG 50V 1M
C524	31607-402-210	CE04W TAPG 50V 1M
C525	31607-402-550	CE04W 50V 6.8U-M
C526	31417-109-140	CK45 TAPG F 50V 103-Z
C535	31407-105-300	CC45(T) CH 50V 680-J
C601	31407-105-260	CC45(T) CH 50V 470-J
C602	31407-105-260	CC45(T) CH 50V 470-J
C603	31417-109-220	CK45 TAPG F 50V 223-Z
C604	31607-401-460	CE04W TAPG 16V 47M
C605	31417-109-220	CK45 TAPG F 50V 223-Z
C606	31507-127-008	ECQ B1 H 223J F3
C607	31507-127-010	ECQ B1H 473J F3/2E 63V 4
C608	31607-402-210	CE04W TAPG 50V 1M
C609	31607-402-530	CE04W TAPG 50V 0.47U-NP
C610	31607-402-530	CE04W TAPG 50V 0.47U-NP
C611	31607-402-250	CE04W TAPG 50V 10M
C612	31607-402-210	CE04W TAPG 50V 1M
C613	31507-127-012	EVQB1 H 104J-F3/2E 63V 1
C614	31507-127-002	ECQ B1H 222J F3
C615	31507-127-016	ECQ B1 H 472J F3
C616	31607-402-070	CE04W TAPG 35V 22M
C617	31607-401-770	CE04W TAPG 25V 2200M-M(S
C618	31507-127-006	ECQ B1 H 103J F3
C620	31607-402-110	CE04W TAPG 35V 220M-M
C621	31507-127-002	ECQ B1H 222J F3
C623	31607-402-250	CE04W TAPG 50V 10M
C701	31417-109-140	CK45 TAPG F 50V 103-Z
**C801	31569-204-190	250V 0.47M/KNB 1530
**C802	31569-204-190	250V 0.47M/KNB 1530
C803	31467-502-220	CK45P TAPG E250V 222-Z(1
C804	31467-502-220	CK45P TAPG E250V 222-Z(1
C805	31467-502-220	CK45P TAPG E250V 222-Z(1
C806	31467-502-220	CK45P TAPG E250V 222-Z(1
**C807	31606-403-780	CE04W 400V 100M-M(LIG)R
C808	31607-401-470	CE04W TAPG 16V 100M VENT
C809	31407-105-700	CC45(T) CH 50V 151-J
**C810	31509-332-000	CQ922M 100V 0.0082-J
C811	31607-402-250	CE04W TAPG 50V 10M
C812	31507-127-004	ECQ B1 H 562J F3
C813	31607-401-470	CE04W TAPG 16V 100M VENT
**C814	31509-391-090	CQ922M 1600V 0.0022-J
C816	31417-901-660	CK45(T) B1KV 222-K
C817	31607-401-680	CE04W TAPG 25V 100U
C818	31469-504-060	ECK-DNS472MEX/E400V 472(
C819	31469-504-060	ECK-DNS472MEX/E400V 472(
C823	31417-767-331	CK45(T) B2KV 331-K
C824	31609-403-140	CE04W 160V 220U-M

Loc No	Supplier Parts No.	Specification
C825	31607-401-720	CE04W TAPG 25V 1000M-M
C827	31417-767-331	CK45(T) B2KV 331-K
C828	31607-401-770	CE04W TAPG 25V 2200M-M(S
C829	31607-401-510	CE04W TAPG 16V 1000U-M
C832	31607-401-140	CE04W TAPG 6.3V 1000M-M
C833	31417-767-331	CK45(T) B2KV 331-K
C834	31607-402-110	CE04W TAPG 35V 220M-M
C835	31507-127-006	ECQ B1 H 103J F3
C836	31417-109-140	CK45 TAPG F 50V 103-Z
C901	31407-047-121	CC45 TAPG RH 50V 121-J
C902	31407-105-660	CC45(T) CH 50V 101-J
C903	31407-105-660	CC45(T) CH 50V 101-J
C904	31607-403-450	CE04W TAPG 250V 1M
C905	31417-767-102	CK45(T) B2KV 102-K
C907	31417-104-250	CK45 TAPG B 50V 471-K
C908	31417-104-250	CK45 TAPG B 50V 471-K
C909	31417-104-250	CK45 TAPG B 50V 471-K
CP01	31417-109-140	CK45 TAPG F 50V 103-Z
CP02	31407-105-700	CC45(T) CH 50V 151-J
CV01	31829-105-610	TZ03P 450E
RC01	31507-127-001	ECQ B1 H 152J F3
RC02	31507-127-025	ECQ-V1H 334J Z3/2E 63V 3
RC03	31507-127-025	ECQ-V1H 334J Z3/2E 63V 3
RC04	31417-109-140	CK45 TAPG F 50V 103-Z
RC05	31607-402-200	CE04W TAPG 50V 0.47M
RC06	31607-402-200	CE04W TAPG 50V 0.47M
RC07	31607-402-240	CE04W TAPG 50V 4.7M
RC08	31507-127-012	EVQB1 H 104J-F3/2E 63V 1
RC09	31407-105-280	CC45(T) CH 50V 560-J
RC10	31607-401-450	CE04W TAPG 16V 33M
RC11	31507-127-000	ECQ B1 H 102J F3
RC12	31607-401-470	CE04W TAPG 16V 100M VENT
RC13	31507-127-012	EVQB1 H 104J-F3/2E 63V 1
RC14	31607-402-250	CE04W TAPG 50V 10M
RC15	31607-401-470	CE04W TAPG 16V 100M VENT
RC16	31607-401-470	CE04W TAPG 16V 100M VENT
RC17	31407-105-700	CC45(T) CH 50V 151-J
RC20	31407-048-820	CC45(T) RH 50V 820-K
RC22	31417-109-140	CK45 TAPG F 50V 103-Z
RC35	31417-109-100	CK45 TAPG F 50V 102-Z
RC36	31417-104-400	CK45 TAPG B 50V 102-K
		I C
DZ824	32119-103-060	UPC574J
IC101	32119-102-250	TDA8305
IC201	32119-110-000	KA2186
IC501	32119-103-360	TDA3561A/N8
IC601	32109-410-270	TC4066BP
IC803	32117-401-110	MC7805C (AUTO)
RIC01	32109-110-021	PCA84C640P/030
RIC02	32109-201-430	PCF8582 AP
		TRANSISTORS
Q101	32137-301-090	2SC388ATM(TAPG)
Q201	32137-301-720	KSC 815-Y(TAPG)
**Q401	32137-301-560	KSC 2331-Y(TAPG)
Q601	32137-301-720	KSC 815-Y(TAPG)
Q602	32137-301-720	KSC 815-Y(TAPG)

Loc No	Supplier Parts No.	Specification
Q603	32137-301-720	KSC 815-Y(TAPG)
Q701	32137-301-720	KSC 815-Y(TAPG)
Q702	32137-301-720	KSC 815-Y(TAPG)
Q703	32137-401-530	KSA 539-Y(TAPG)
**Q802	32147-401-270	KSD 288-Y (AUTO)
Q901	32149-301-190	2SC2068
Q902	32149-301-190	2SC2068
Q903	32149-301-190	2SC2068
Q904	32137-301-720	KSC 815-Y(TAPG)
RQ01	32137-301-720	KSC 815-Y(TAPG)
RQ08	32137-301-720	KSC 815-Y(TAPG)
RQ09	32137-301-720	KSC 815-Y(TAPG)
RQ10	32137-301-720	KSC 815-Y(TAPG)
RQ11	32137-301-560	KSC 2331-Y(TAPG)
	DIODES	
D201	32167-201-070	1N4003 TAPG
D302	32167-201-170	TVR10G(TAPG)
D401	32167-201-160	TVR06G(TAPG)
D402	32167-201-160	TVR06G(TAPG)
D404	32167-201-070	1N4003 TAPG
D501	32167-406-480	1N4148 TAPG
D502	32167-101-130	1K34A (TAPG)
D503	32167-406-480	1N4148 TAPG
D506	32167-406-480	1N4148 TAPG
D507	32167-406-480	1N4148 TAPG
D508	32167-406-480	1N4148 TAPG
D601	32167-406-480	1N4148 TAPG
D602	32167-401-800	EQA02-06A/MTZ5.6B(TAPG)
D701	32167-406-480	1N4148 TAPG
D702	32167-406-480	1N4148 TAPG
D703	32167-406-480	1N4148 TAPG
D704	32167-406-480	1N4148 TAPG
D801	32167-201-180	M100J(TAPG)
D802	32167-201-180	M100J(TAPG)
D803	32167-201-180	M100J(TAPG)
D804	32167-201-180	M100J(TAPG)
D805	32167-208-550	ERC24-06
D806	32167-208-550	ERC24-06
D807	32167-406-480	1N4148 TAPG
D808	32167-208-550	ERC24-06
D809	32167-208-550	ERC24-06
D821	32167-208-550	ERC24-06
D822	32167-208-550	ERC24-06
D823	32167-208-550	ERC24-06
DZ807	32167-408-080	EQA02-06D/MTZ6.2B(TAPG)
J107	32167-406-480	1N4148 TAPG
RD02	32167-406-480	1N4148 TAPG
RD03	32167-406-480	1N4148 TAPG
RD04	32167-406-480	1N4148 TAPG
RD05	32167-406-480	1N4148 TAPG
RD06	32167-406-480	1N4148 TAPG
RD07	32167-401-800	EQA02-06A/MTZ5.6B(TAPG)
RD08	32167-401-800	EQA02-06A/MTZ5.6B(TAPG)
RD09	32167-401-800	EQA02-06A/MTZ5.6B(TAPG)
RD10	32167-401-800	EQA02-06A/MTZ5.6B(TAPG)

Loc No	Supplier Parts No.	Specification
	THERMISTOR	
**P802	32189-102-030	P2462-J29/J29-P190-A20
	POSISTOR	
**P801	32189-605-500	PTH45 A102BG180N270
	MODULE-REMOCON	
PA01	32199-411-006	LTM 9034
	LED	
LD01	32309-110-230	DS2 (DL-ILR)/SL-5R
	COILS	
D-COIL	32479-029-210	9.3RT25L2300
L102	32429-020-010	0.5UH-K
L103	32429-904-580	1.5UH-K
L200	32427-805-110	1UH-M
L201	32427-803-130	10UH-K TAPG
L403	32429-805-980	6800UH-K
L404	32449-705-020	DS48-157UH
L405	32449-411-110	350UH
L501	32427-803-410	8.2UH-M
L502	32427-803-410	8.2UH-M
L503	32427-822-010	15UH-J TAPG
L601	32427-805-450	12UH-K TAPG
L801	32429-633-090	39MHX2(U)
L802	32429-226-080	1UH-K
L803	32429-226-160	4.7UH-K
L824	32499-008-010	43UH
L901	32429-039-090	170UH-K
L902	32499-003-010	12UH K-16
	DELAY-LINE	
DL501	32469-010-120	ADL-CP144E
X201	32469-200-000	CDL471P
	TRANS	
T101	32717-513-800	38.9MHZ(S-60)
**T401	32849-070-002	7.3MH/105UH
T501	32709-024-260	4MHZ
T601	32729-601-020	5.5MHZ
**T801	32899-002-405	P:160-260 S:125/18/12V
	TRANS-FLY BACK	
**T444	32859-200-000	FCM-20A015
	CRT-SOCKET	
V999A	33359-063-620	HF-29.1A
	CORE-FERRITES	
L804	34047-019-060	3.5X6X1.0
L805	34047-019-060	3.5X6X1.0
	SPEAKER	

X-RADIATION PRECAUTION

1. The excessive high voltage can produce potentially hazardous X- RADIATION. To avoid such hazards, the high voltage must not exceed the specified limit. The norminal value of the high voltage of this receiver is 24.0KV at zero beam current (minimum brightness). The high voltage must not, under any circumstances, exceed 30KV. Each time a receiver requires servicing and the high voltage should be checked following the HIGW VOLTAGE CHECK procedure in this manual. It is recommended that the reading of the high voltage should be recorded as a part of the service record. It is important to use an accurate and reliable high voltage meter. This receiver is equipped with a Fail Safe (FS)circuit which prevents the receiver from producing an excessively high voltage even if the B^+ voltage increases abnormally. Each time the receiver is serviced, the FS circuit must be checked to determine that if the circuit is properly functioning, following the FS CIRCUIT CHECK procedure in this manual.
2. The only source of X-RADIATION is this TV receiver. It is the picture tube. For continued X-RADIATION protection. the replacement tube must be exactly the same type as specified in the parts list.
3. Some parts in this receiver have special safety related characteristics for X-RADIATION protection. For continued safety, the parts replacement should be undertaken only after referring to the PRODUCT SAFETY NOTICE.

SAFETY PRECAUTION

Warning : The serivce should not be attempted by anyone unfamiliar with the necessary precautions in this receiver. The followings are the necessary precautions to be observed before servicing.

Since the chassis of this receiver is directly connected to the AC power line-(Hot chassis) ,an isolation transformer should be used during any dynamic service to avoid possible shock hazards.

1. Always discharge the picture tube anode to the CRT conductive coating before handling the picture tube. The picture tube is highly evacuated and if broken, the glass fragments will be violently expelled. Use shatterproof goggles and keep the picture tube away from the bare body during a handling.
2. When replacing a chassis in the cabinet, it is always certain that all the protective devices are put back in place, such as non - metallic control knobs, insulating covers, shields, isolation resistor-capacitor network, etc.
3. Before returning the set to the customer, always perform an AC leakage current check on the exposed metallic parts of the cabinet, such as antennas, terminal, screwheads, metal overlays, control shafts, etc. To be sure the set is safe to operate without danger of electrical shock. Plug the AC line cord directly to the AC outlet (do not use a line isolation transformer during this check). Use an AC voltmeter having 5000 ohm per volt or more sensitivity in the following manner. Connect a 1500 ohm 10 watt resistor, paralleled by a 0.15μF, AC type capacitor, between a good earth ground(water pipe, conduit etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination of 1500 ohm resistor and 0.15μF capacitor. Reverse the AC plug at the AC outlet and repeat the AC voltage measurements for each exposed metallic part. The measured voltage must not exceed 0.3 volts RMS. This corresponds to 0.2 milliamp AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.

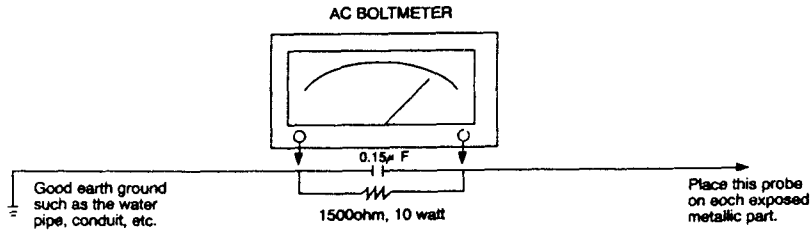
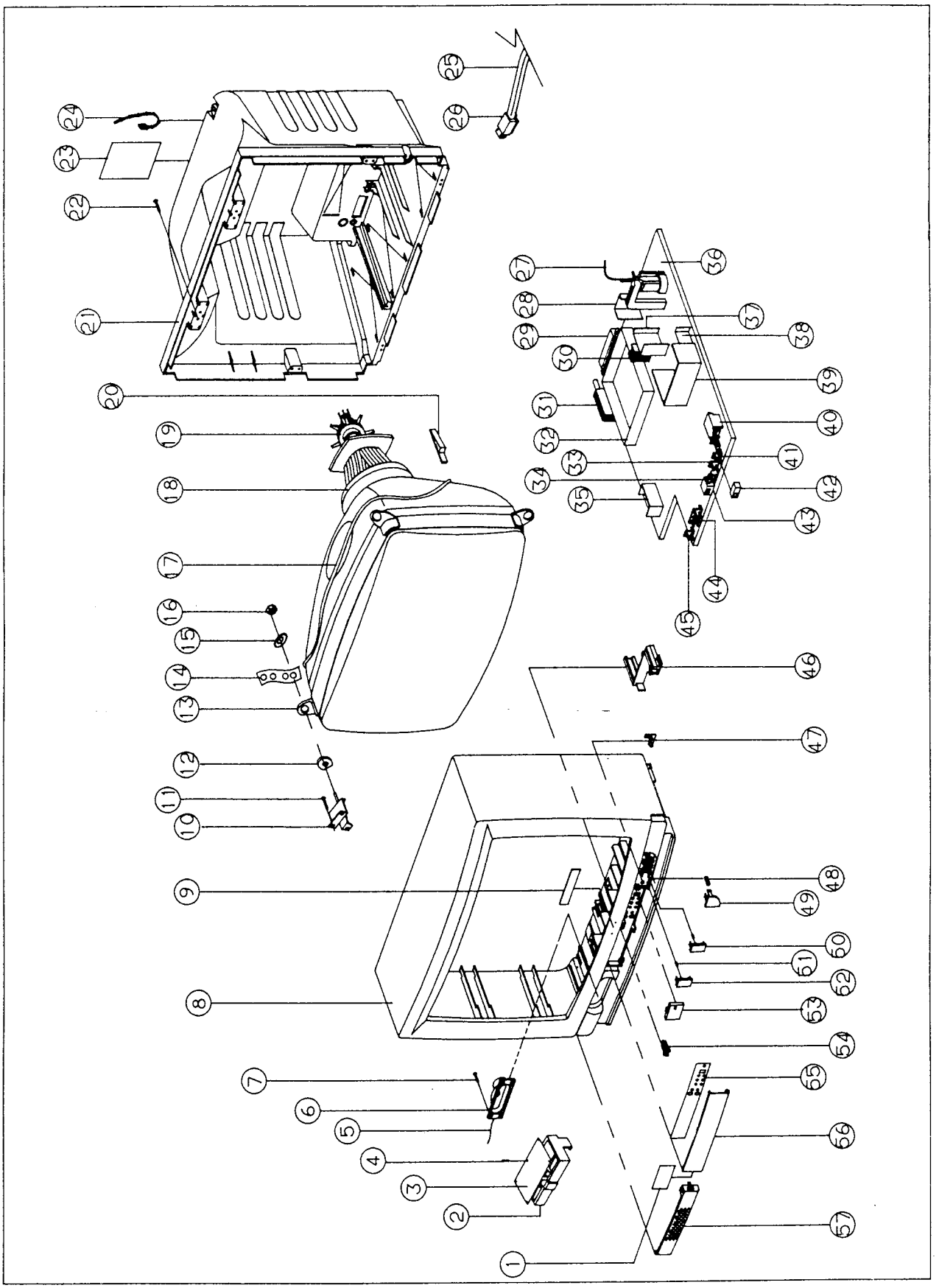

AC BOLTMETER
0.15μ F
Good earth ground such as the water pipe, conduit, etc.
1500ohm, 10 watt
Place this probe on each exposed metallic part.

Figure 1. AC Leakage Current Check

12. EXPLODED-VIEW



CT2125K/AKAIX

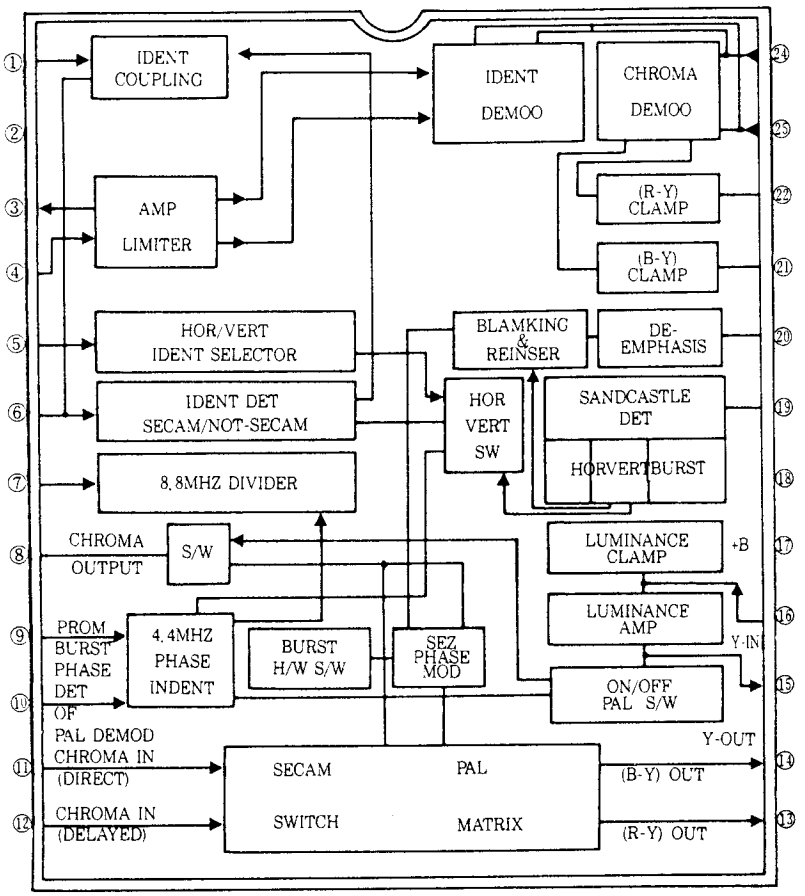
The items with "*" are usually out of stock since they are seldom required for the routine service. There may be some anticipated delay when you order these items.
*** S.N.A = SERVICE NOT AVAILABLE. ***

NO	CODE NO	DESCRIPTION	SPECIFICATION	Q'TY
1	38093-115-420	PVC-DOOR	PVC SHEET T0.3 BLK	1
2	36602-104-610	HOLDER-TTX	ABS V0 GRY	1
3	*3D31-00810-040	ASSY-PWB,SUB TTX	CI5322T	1
	33004-145-251	PWB-TTX <S.N.A>	10X130X1.6T	1
4	37148-530-081	SCREW-TAP,RH	2S-3X8 FE FZY	1
5	33058-003-016	LEAD-CONNECTOR,ASSY	S3(2)/F/400	1
6	34209-169-140	SPEAKER-GENERAL	5902BR 3W	1
7	37148-530-121	SCREW-TAP,RH	2S-3X12 FE FZY	4
8	36001-675-010	CABINET-FRONT	HIPS V0 BLK #066	1
9	38024-179-311	BADGE-BRAND	AL-FORGING	1
10	36614-212-730	BRKT-CRT	SBHG-1 100 EGI T1.6	4
11	37148-540-152	SCREW-TAP,RH	2S-4X15 FE FZW	12
12	37333-101-020	WASHER-GUM,CRT	NATURAL RUBBER BLK	4
13	32019-255-108	CRT-COLOR	54HGB99X-ITC	1
14	36634-111-720	CLAMPER	PVC V0 BLK T0.7 140MM	4
15	DELETE ITEM			
16	37204-101-410	NUT-CRT	M5 NUT+W/S AUTO	4
17	32479-029-210	COIL-DEGAUSSING	9.3R T25 L2300	1
18	I T C	DEFL-YOKE		
19	I T C	MAGNET-CONVERGENCE		
20	I T C	SPACER-DY		
21	36001-634-010	CABINET-BACK	HIPS V0 BLK	1
22	37128-540-152	SCREW-TAP,TH	2S-4X15 FE FZW	6
23	38113-120-000	LABEL-RATING	TETRONE PAPER 90(S)	1
24	36633-101-610	CLAMPER-CORD	P.E HB BLK	1
25	33054-801-114	POWER-CORD	GTBS-2F/7.5F+BLK-HOU	1
26	36603-111-310	HOLDER-CORD	P.P V0 BLK(NEW)	1
27	32859-200-000	TRANS-FLYBACK	FCM-20A015	1
28	*3H82-00170-001	ASSY-H/S,VERT(HORI)	2SD1651	1
29	33136-103-030	RECEPTACLE-PERI	HXC-1510-01-300A(R)	1
30	*3H84-00020-000	ASSY-H/S,TR	MC7812C	1
31	34519-970-060	TUNER	ECC-5883CE(D)	1
32	34543-112-910	SHIELD-CASE	SPTE T0.25 P58SC	1
33	33606-101-010	SWITCH-TACT	KPT2105 ROBOT	1
34	36043-104-610	GUIDE-LED	ABS V0 BLK	1

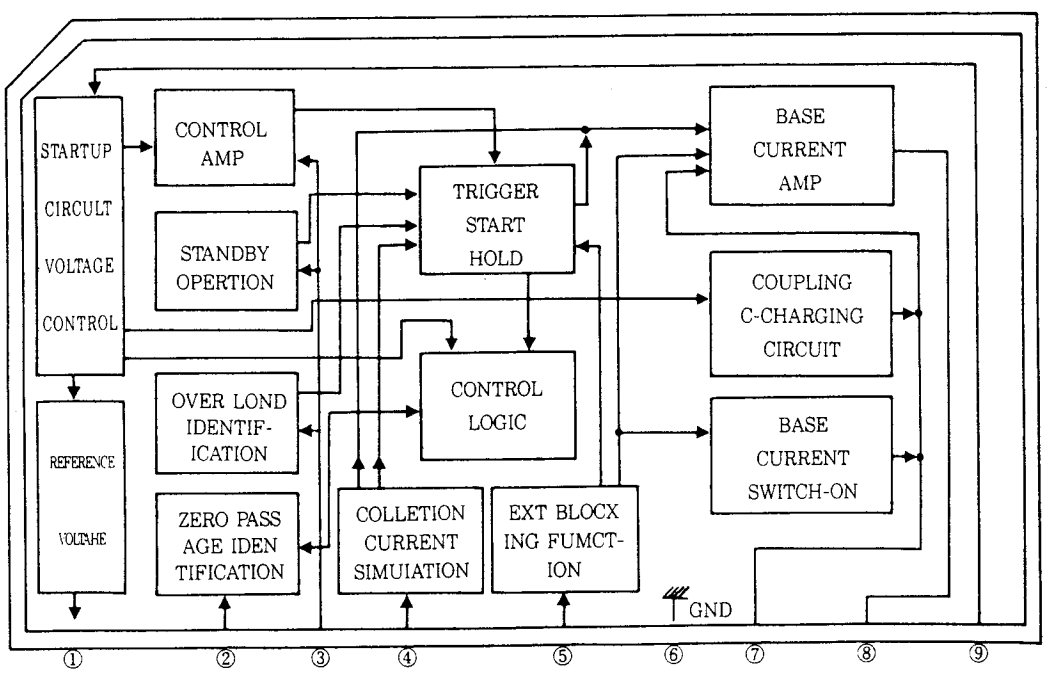
NO	CODE NO	DESCRIPTION	SPECIFICATION	Q'TY
35	*3H82-00070-000	ASSY-H/S,VERT(SOUND)	TDA1013A	1
36	*3T30-01382-060	ASSY-CHASSIS(OPTION)	CT2125UK/AKAIX	1
	33004-145-601	PWB-MAIN <S.N.A>	330X245X1.6T P58S(H)	1
37	*3H82-00170-003	ASSY-H/S,VERT	KA2131	1
38	*3H82-00080-000	ASSY-H/S,VERT(POWER)	TDA4601	1
39	*3H83-00200-000	ASSY-H/S,POWER	2SC3552	1
40	33529-402-006	SWITCH-PUSH,POWER	ESB-99832V	1
41	33606-101-010	SWITCH-TACT	KPT2105 ROBOT	1
42	37624-623-610	KNOB-SUB,MATERIAL	ABS HB BLK	1
43	32199-411-006	MODULE-REMOCON	LTM9034	1
44	33606-101-009	SWITCH-TACT(3K)	KPT-2105-31(R)	1
45	33606-101-010	SWITCH-TACT	KPT2105 ROBOT	1
46	36022-118-710	RAIL-PCB	ABS V0 GRY	1
47	38013-117-110	INDICATOR-LED	ACRYL CLR	1
48	36674-140-850	SPRING-COIL	SUS 0.05 CX-5322T	1
49	37623-159-340	KNOB-POWER	ABS HB BLK #066	1
50	37623-159-130	KNOB-CHANNEL	ABS HB BLK #066	1
51	36674-137-820	SPRING-COIL	SUS PI0.5	4
52	37623-159-230	KNOB-VOLUME	ABS HB BLK #066	1
53	37653-137-220	WINDOW-RMC	PC141-21051	1
54	36698-100-110	CATCH-PUSH,DOOR	KIFUCO LA701	1
55	38093-110-810	PVC-CONTROL	PVC SHEET T0.3 BLK	1
56	37643-170-350	DOOR-CONTROL	HIPS HB BLK #066	1
57	37713-232-210	GRILLE-WOOFER	SPC-1 T0.5 #677	1

SEMICONDUCTOR BLOCK DIAGRAM

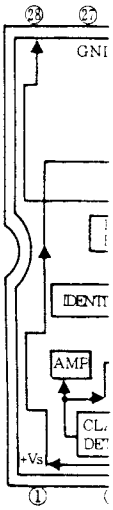
1. PAL/SECAM-TRANSCODER(TDA3590)



2. POWER CONTROL(TDA4601)

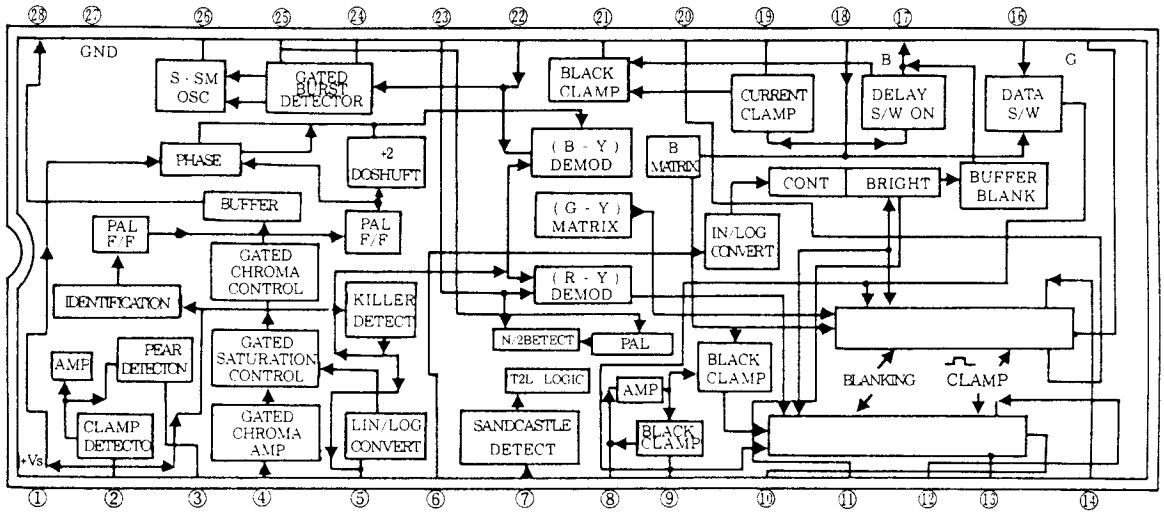


3. CHROMA

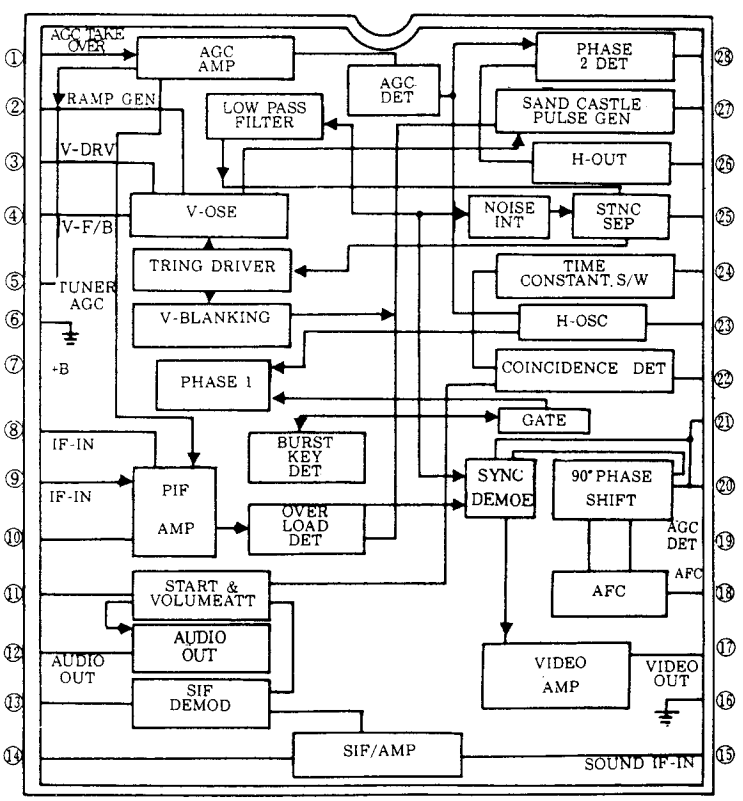


4. PIF. SIF. H

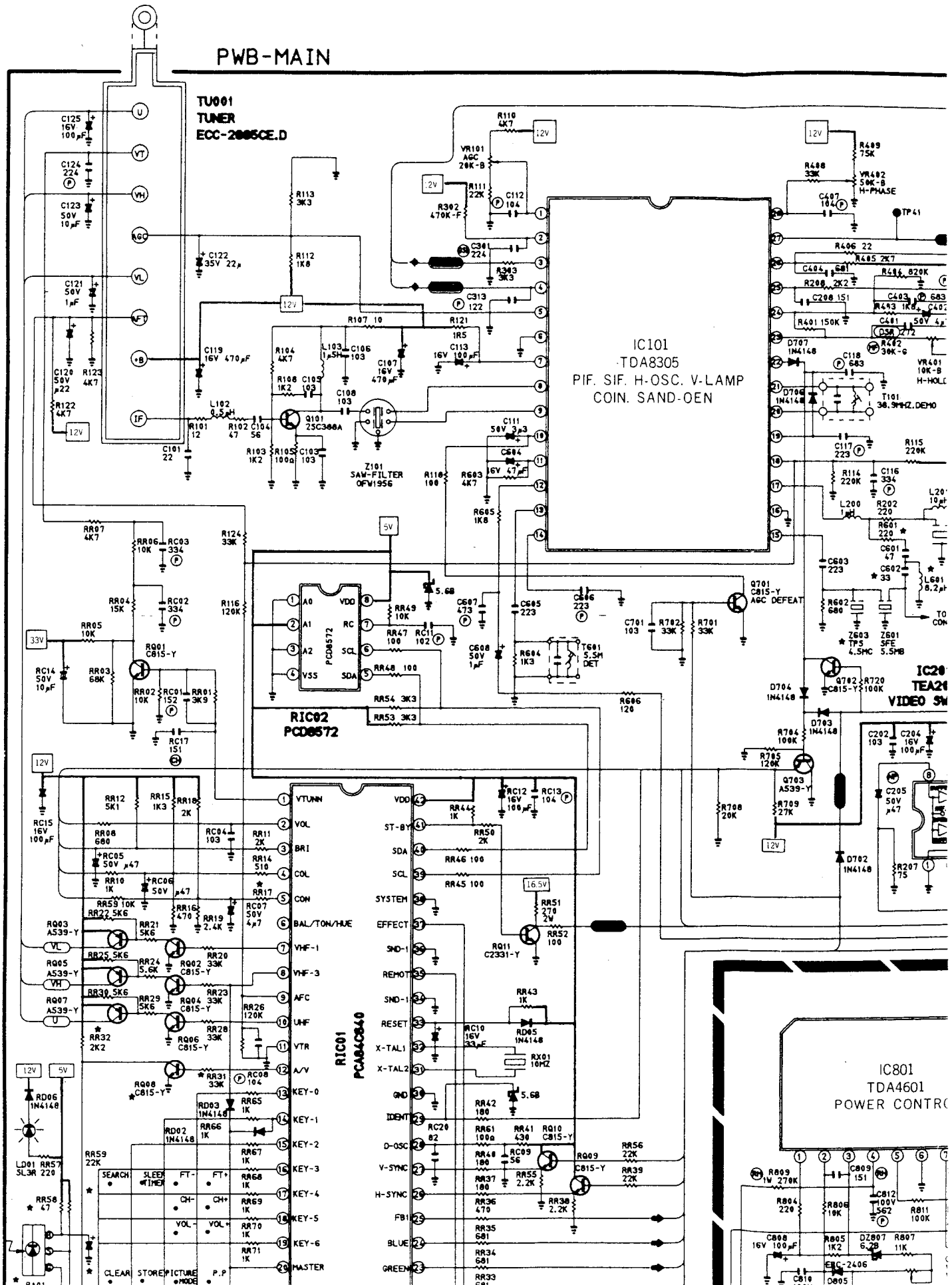
3. CHROMA DECORDER(TDA3562A)

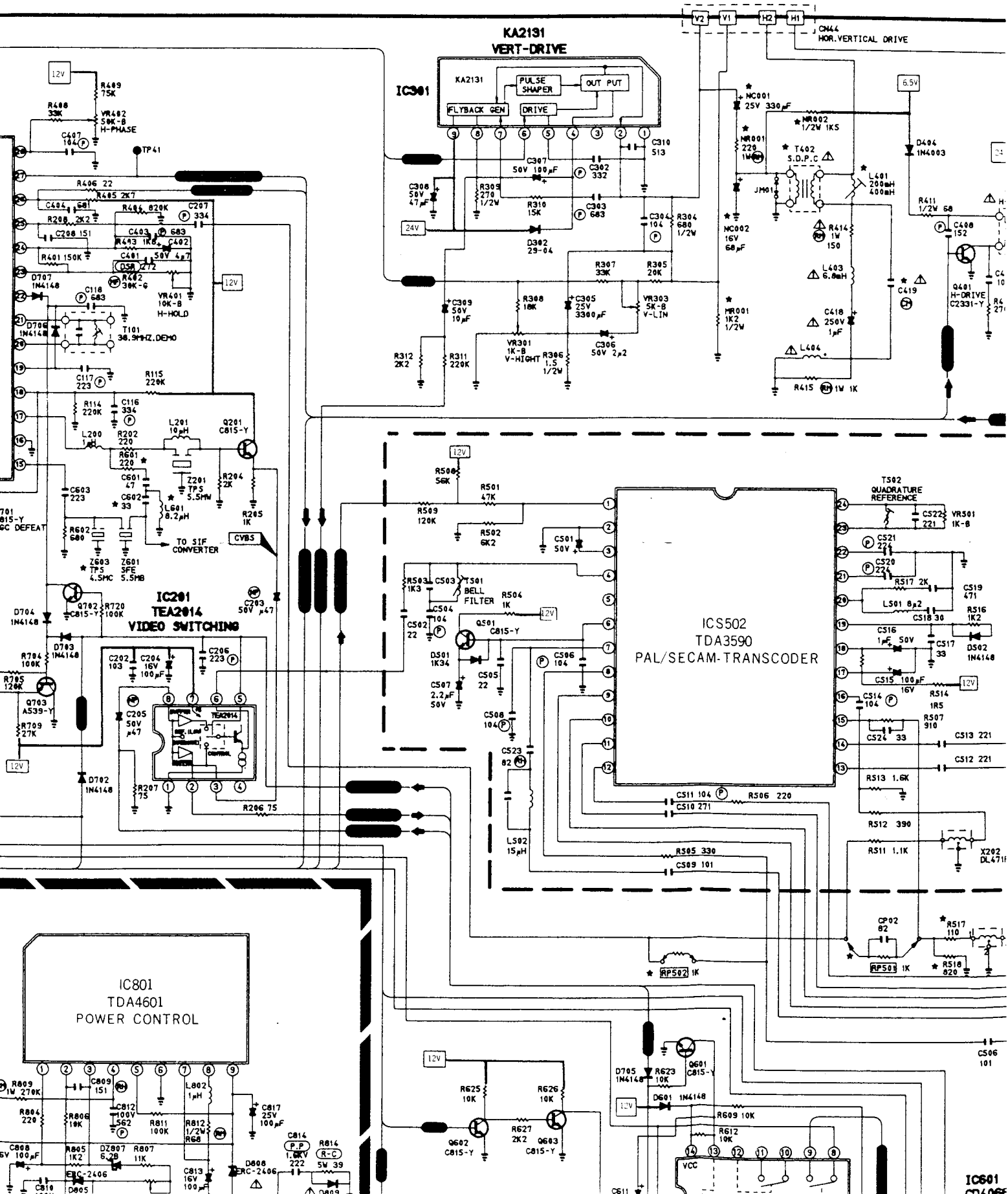


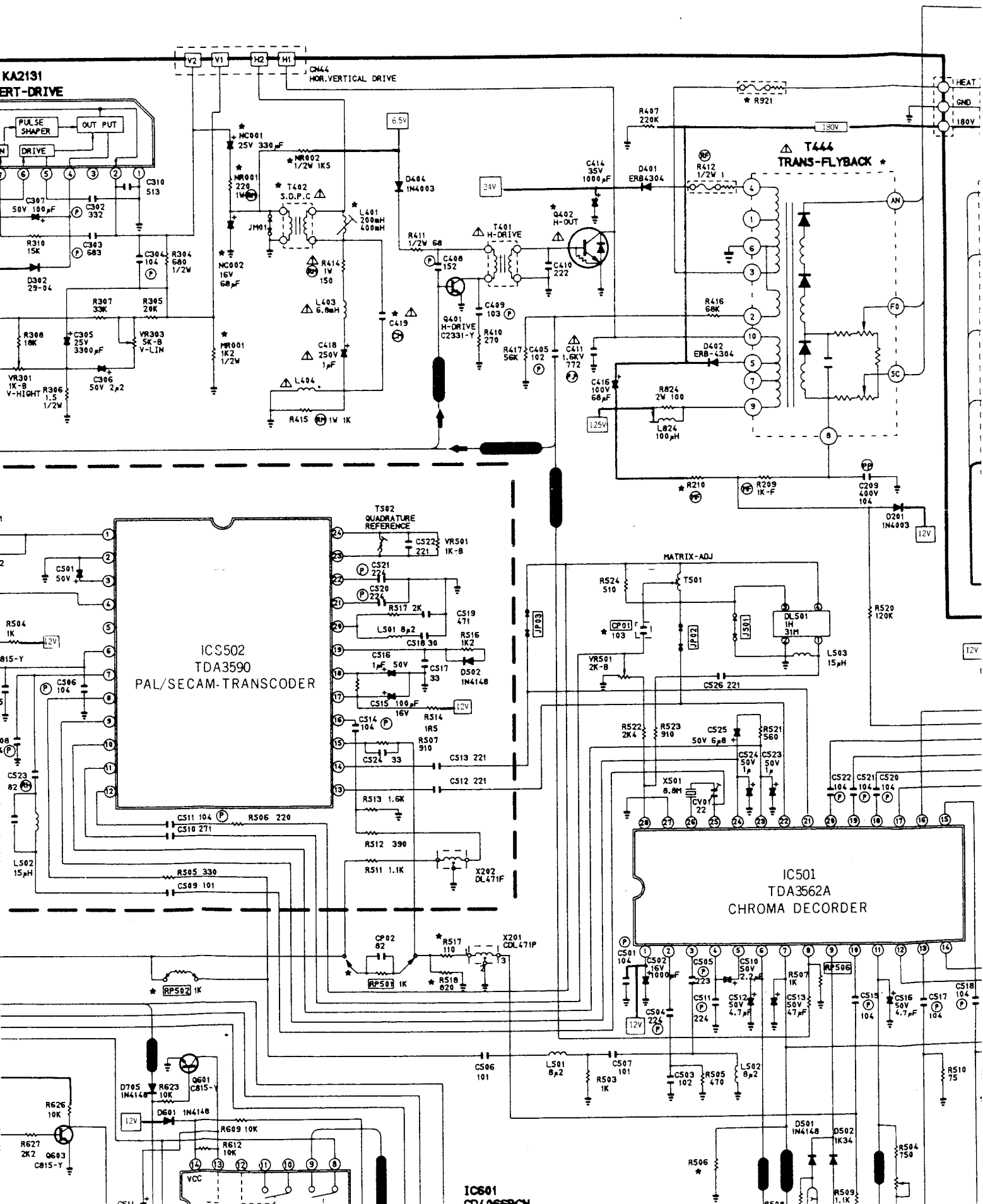
4. PIF.SIF.H-OSC V-RAMP.COIN. SAND-GEN(TDA8305)

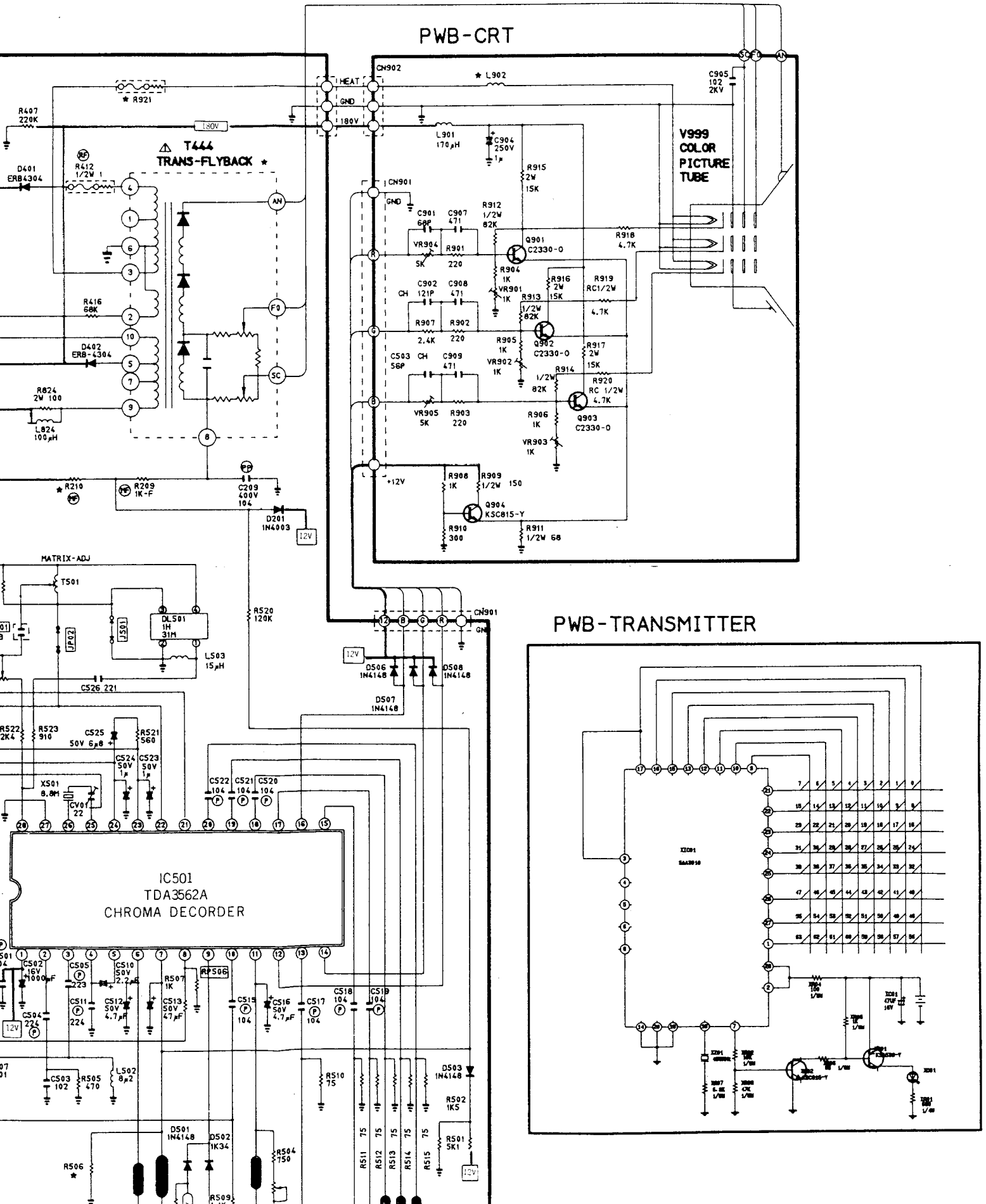


SCHEMATIC DIAGRAM
P58SC (H)



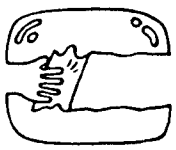

KA2131
VERT-DRIVE
IC301
KA2131
PULSE SHAPER
OUT PUT
FLYBACK GEN
DRIVE
V2
V1
H2
H1
CN44
HOR.VERTICAL DRIVE
IC201
TEA2014
VIDEO SWITCHING
TO SIF CONVERTER
CVBS
ICS502
TDA3590
PAL/SECAM-TRANSCODER
IC801
TDA4601
POWER CONTROL
IC601


KA2131
ERT-DRIVE
PULSE SHAPER
OUT PUT
DRIVE
CN44
HOR.VERTICAL DRIVE
V2
V1
H2
H1
6.5V
24V
130V
125V
12V
T444
TRANS-FLYBACK
T402
S.D.P.C
T401
H-DRIVE
Q401
H-DRIVE
C2331-Y
Q402
H-OUT
D401
ER84304
D402
ERB-4304
D404
1N4003
D201
1N4003
L401
200mH
400mH
L403
6.8mH
L404
C418
250V
1μF
C419
C414
35V
1000μF
C416
100V
68μF
C411
1.6KV
772
R921
R407
220K
R412
1/2W 1
R411
1/2W 68
R414
1W
150
R415
1W 1K
R416
68K
R417
56K
R410
270
R824
2W 100
L824
100μH
R210
R209
1K-F
C209
400V
104
VR301
1K-B
V-HIGHT
VR303
5K-B
V-LIN
C305
25V
3300μF
C306
50V 2μ2
R306
1.5
1/2W
R307
33K
R305
20K
R308
18K
C307
50V 100μF
C310
513
C302
332
C303
683
C304
104
R304
680
1/2W
R310
15K
D302
29-04
NC001
25V 330μF
NR002
1/2W 1K5
NR001
220
1W
NC002
16V
68μF
NR001
1K2
1/2W
JM01
TS02
QUADRATURE
REFERENCE
ICS502
TDA3590
PAL/SECAM-TRANSCODER
CS22
221
VRS01
1K-B
CS21
224
CS20
224
RS17 2K
CS19
471
LS01 8μ2
CS18 30
RS16
1K2
CS16
1μF 50V
CS17
33
D502
1N4148
CS15 100μF
16V
RS14
1R5
CS14
104
RS07
910
CS24 33
CS13 221
CS12 221
RS13 1.6K
CS11 104
CS10 271
RS06 220
RS12 390
RS11 1.1K
X202
DL471F
LS02
15μH
RS05 330
CS09 101
CS01
50V
R504
1K
C815-Y
CS06
104
C523
82
CP02
82
R517
110
X201
CDL471P
R518
820
RP501 1K
RP502 1K
MATRIX-ADJ
T501
R524
510
CP01
103
JP03
JP02
J501
DL501
1H
31M
LS03
15μH
R520
120K
VRS01
2K-B
CS26 221
R522
2K4
R523
910
CS25
50V 6μ8
RS21
560
CS24
50V
1μ
CS23
50V
1μ
X501
8.8M
CV01
22
IC501
TDA3562A
CHROMA DECORDER
RP506
RS07
1K
CS01
104
CS02
16V
1000μF
CS05
223
CS10
50V
2.2μF
CS12
50V
4.7μF
CS13
50V
47μF
CS16
50V
4.7μF
CS04
224
CS11
224
CS15
104
CS17
104
CS18
104
CS22
104
CS21
104
CS20
104
CS06
101
LS01
8μ2
CS07
101
R503
1K
CS03
102
R505
470
LS02
8μ2
R510
75
R504
750
R509
1.1K
D501
1N4148
D502
1K34
R506
D705
1N4148
R623
10K
Q601
C815-Y
D601
1N4148
RG09 10K
R612
10K
R626
10K
R627
2K2
Q603
C815-Y
VCC
IC601
HEAT
GND
180V

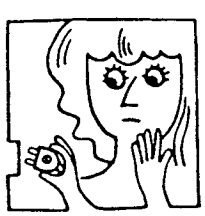

PWB-CRT
PWB-TRANSMITTER
V999
COLOR
PICTURE
TUBE
T444
TRANS-FLYBACK
IC501
TDA3562A
CHROMA DECORDER
MATRIX-ADJ
CN902
CN901
HEAT
GND
180V
+12V
12V
D401
ERB4304
D402
ERB-4304
D201
1N4003
D501
1N4148
D502
1K34
D503
1N4148
D506
1N4148
D507
1N4148
D508
1N4148
Q901
C2330-O
Q902
C2330-O
Q903
C2330-O
Q904
KSC815-Y
L824
100μH
L901
170μH
L502
8μ2
L503
15μH
TS01
DL501
1H
31M
XS01
8.8M
R407
220K
R412
1/2W
R416
68K
R824
2W 100
R210
R209
1K-F
R520
120K
R915
2W
15K
R912
1/2W
82K
R904
1K
VR901
1K
R913
1/2W
82K
R905
1K
VR902
1K
R914
1/2W
82K
R906
1K
VR903
1K
R908
1K
R909
1/2W 150
R910
300
R911
1/2W 68
R916
2W
15K
R917
2W
15K
R918
4.7K
R919
RC1/2W
4.7K
R920
RC 1/2W
4.7K
C905
102
2KV
C904
250V
1μ
C209
400V
104
C526 221
C525
50V 6μ8
C524
50V
1μ
C523
50V
1μ
C522
104
C521
104
C520
104
C502
16V
1000μF
C504
224
C505
223
C510
50V
2.2μF
C511
224
C512
50V
4.7μF
C513
50V
47μF
C515
104
C516
50V
4.7μF
C517
104
C518
104
C519
104
C503
102
R505
470
R506
R507
1K
R510
75
R511
75
R512
75
R513
75
R514
75
R515
75
R501
5K1
R502
1K5
R504
750
R509
RP506

For Safe Use

1. Read all of these instructions.
2. Save these instructions for later use.
3. Unplug this television receiver from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaning.

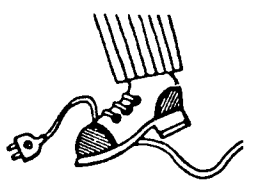


4. Do not use attachments not recommended by the television receiver manufacturer as they may cause hazards.
5. Do not use this television receiver near water for example, near a bathtub, washbowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool, etc.
6. Do not place this television receiver on an unstable cart, stand, or table. The television receiver may fall, causing serious injury to a child or on adult, and serious damage to the appliance. Use only with a cart or stand recommended by the manufacturer, or sold with the television receiver. Wall or shelf mounting should follow the manufacturer's instructions, and should use a mounting kit approved by the manufacturer.
7. Slots and openings in the cabinet and the back or bottom are provided for ventilation, and to insure reliable operation of the television receiver and to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the television receiver should not be placed in a built-in installation such as a bookcase unless proper ventilation is provided.
8. This television receiver should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supplied to your home, consult your television dealer or local power company. For television receivers designed to operated from battery power rerefer to the operating instructions.



9. This television receiver is equipped with a polarized alternating-current line plug (a plug having one blade wider than the other.) This plug will fit the power outlet only one way. This is a safety feature. If you are unable to insert the plug fulli into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.
If your television receiver has a threewire grounding-type plug, please note the following. This television receiver is equipped with a 3-wire grounding type plug (a plug having a third (grounding) pin). This plug will only fit into a grounding type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding plug.

10. Do not allow anything to rest on the power cord. Do not locate this television receiver where the card will be abused by persons walking on it.



11. Follow all warnings and instructions marked on the television receiver.
12. If an outside antenna is connected to the television receiver, be sure the antenna system is grounded so as to provide some protection against voltage surges and built up static charges. Section 810 of the National Electrical Code, NFPA No. 70-1975, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-dicharge unit, connection to grounding electrodes, and requirements for the grounding electrode. See Figure 1.

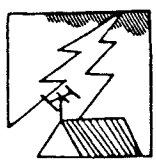
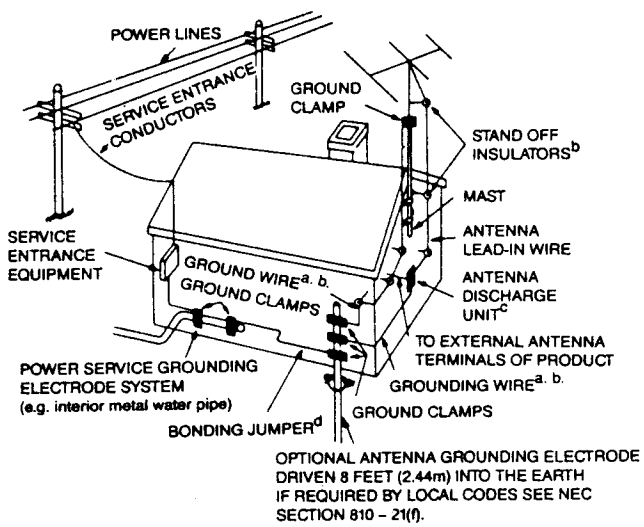
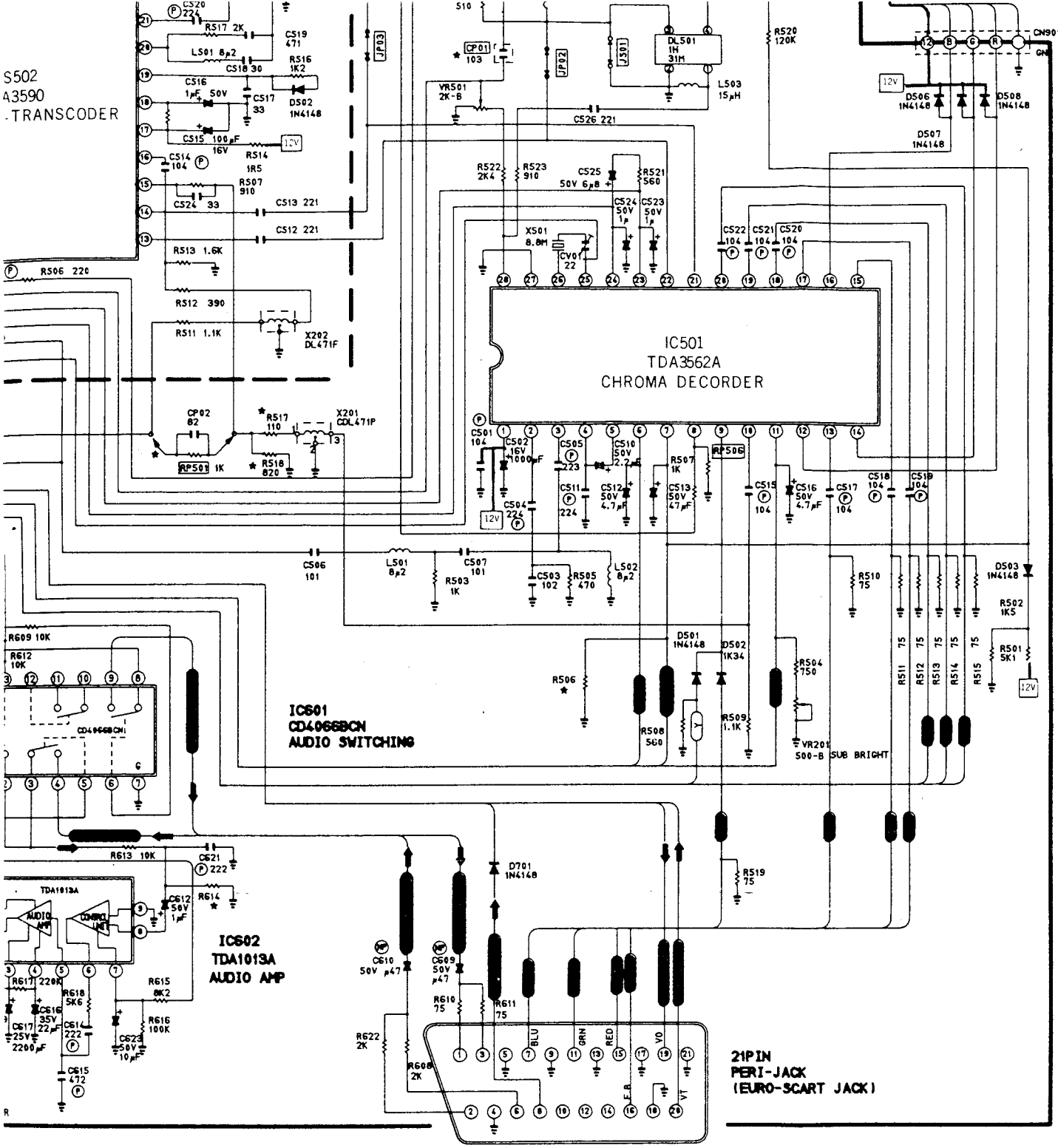


FIGURE 1.
EXAMPLE OF ANTENNA GROUNDING ACCORDING TO NATIONAL ELECTRICAL CODE INSTRUCTIONS CONTAINED IN ARTICLE 810 — "RADIO AND TELEVISION EQUIPMENT"


POWER LINES
SERVICE ENTRANCE CONDUCTORS
GROUND CLAMP
STAND OFF INSULATORS[b]
MAST
ANTENNA LEAD-IN WIRE
SERVICE ENTRANCE EQUIPMENT
GROUND WIRE[a, b]
GROUND CLAMPS
ANTENNA DISCHARGE UNIT[c]
TO EXTERNAL ANTENNA TERMINALS OF PRODUCT
POWER SERVICE GROUNDING ELECTRODE SYSTEM
(e.g. interior metal water pipe)
GROUNDING WIRE[a, b]
GROUND CLAMPS
BONDING JUMPER[d]
OPTIONAL ANTENNA GROUNDING ELECTRODE DRIVEN 8 FEET (2.44m) INTO THE EARTH IF REQUIRED BY LOCAL CODES SEE NEC SECTION 810 - 21(f).

NOTES:

a. Use No. 10 AWB (5.3mm²) copper, No. 8 AWG (8.4mm²) aluminum. No. 17 AWG (1.0mm²) copperclad steel or bronze wire, or larger, as a ground wire.
b. Secure antenna lelad-in and ground-wires to house with stand-off insulators spaced from 4-6 feet (1.22-1.83m) apart.
c. Mount antenna discharge unit as close as possible to where lead-in enters house.
d. Use jumper wire not smaller than No. 6 AWG (13.3mm²) copper, or the equivalent, when a separate antenna-grounding electrode is used.



AND WAVEFORMS

" from point shown to chassis ground. line
bar signal.
y ±20%.
epresentative only.
using a wide band oscilloscope and a low

IGHTNESS,CONTRAST,and COLOUR controls for

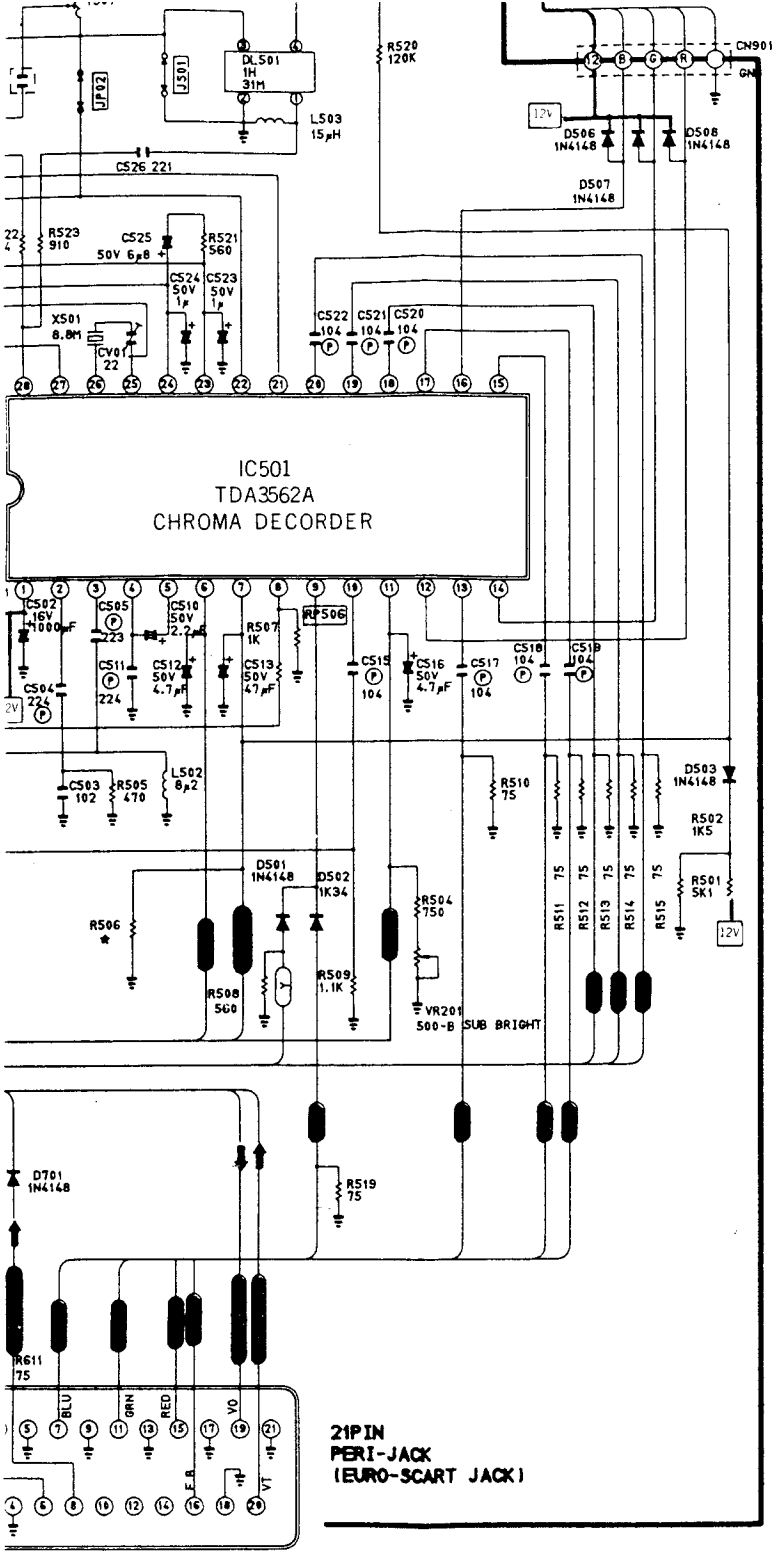
g a standard colour bar signal.

EXPRESSION

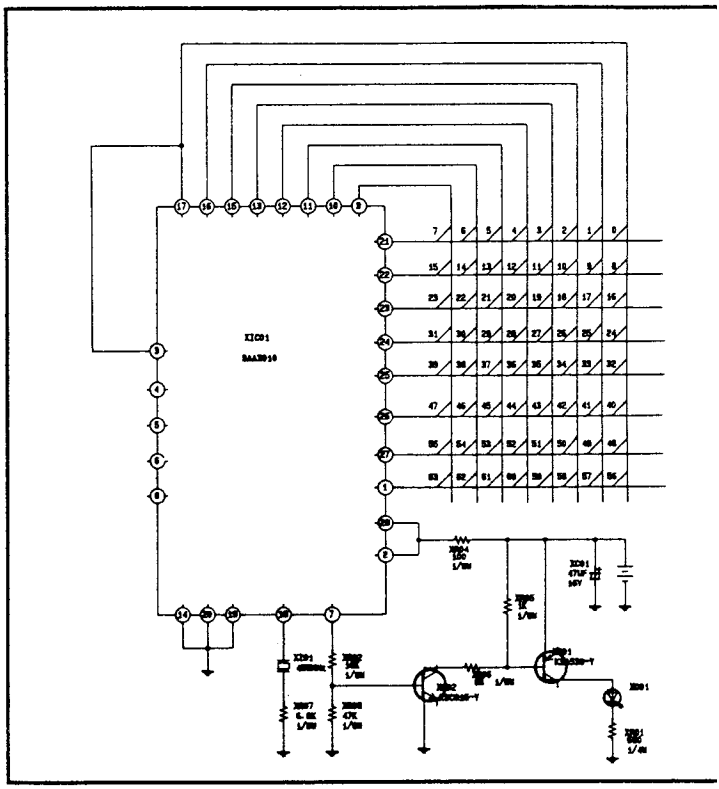
1. Resistance is shown ohm K=1,000 M=1,000,000
2. Unless otherwise noted in schematic all capacitor values less than 1 are expressed in mfd, the values more than 1 in pF.
3. Unless otherwise noted in schematic all inductor values areexpressed in uH, and the values less than 1 in mH.
4. According to the Model's name, it may be impossible to apply and to change the "★" Marking on Schematic Diagram.

NOTE

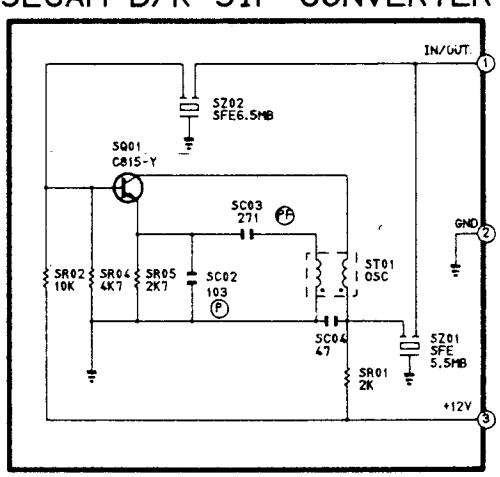
The circuits are subject to change without notice to improve the picture quality.



PWB-TRANSMITTER



SECAM-D/K SIF CONVERTER



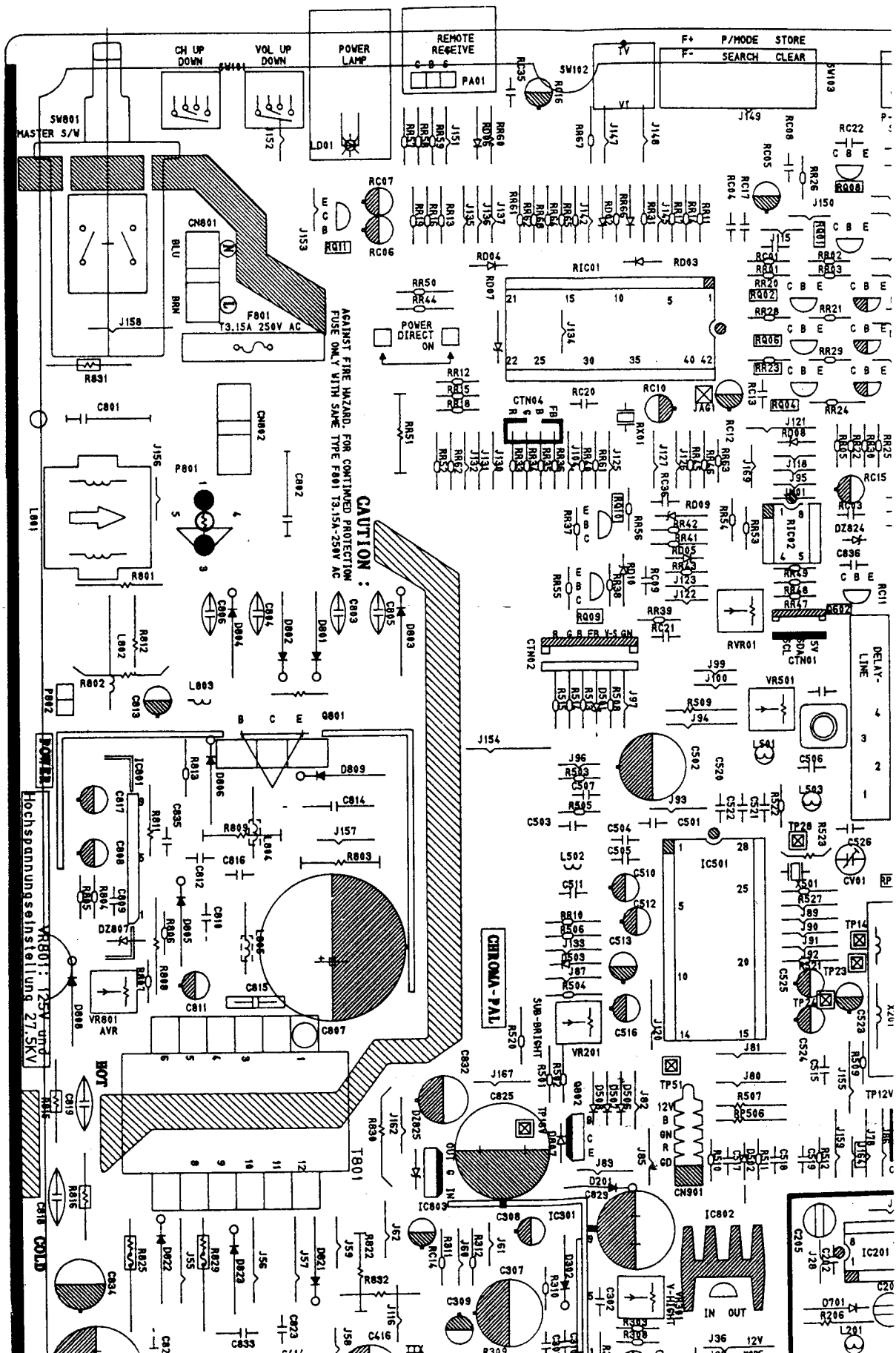
EXPRESSION

Resistance is shown ohm K=1,000 M=1,000,000
Unless otherwise noted in schematic all capacitor values less than 1 are expressed in mfd, the values more than 1 in pF.
Unless otherwise noted in schematic all inductor values areexpressed in uH, and the values less than 1 in mH.
According to the Model's name, it may be impossible to apply and to change the "★" Marking on Schematic Diagram.

NOTE

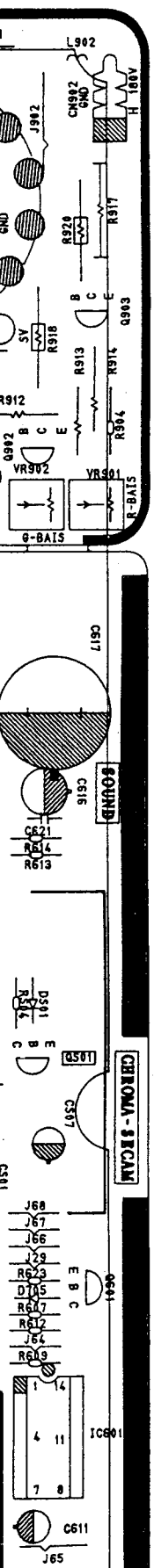
The circuits are subject to change without notice to improve the picture quality.

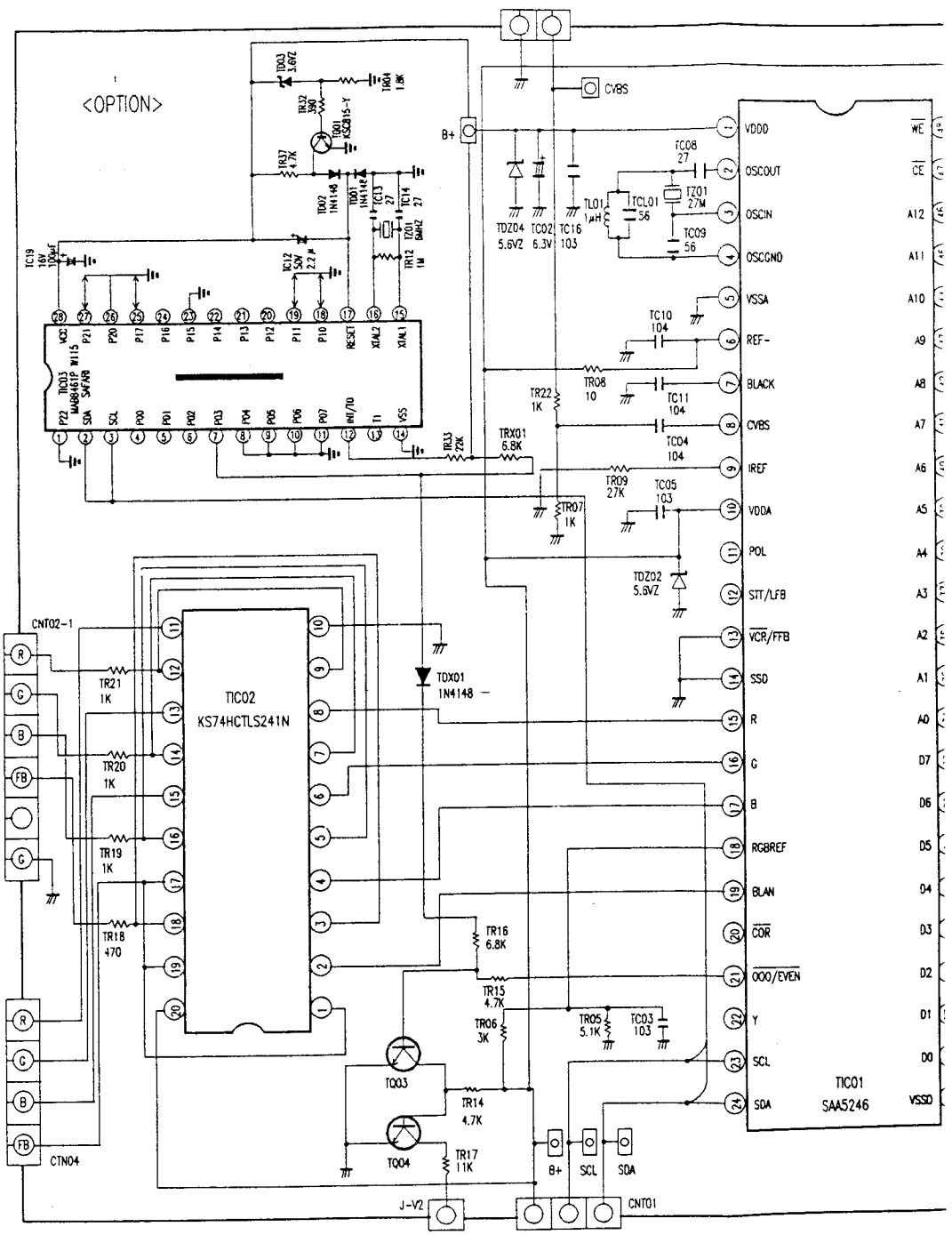
PWB-MAIN


CH UP DOWN
VOL UP DOWN
POWER LAMP
REMOTE RECEIVE
PA01
SW102
SW103
SW801 MASTER S/W
LD01
CN801
BLU
BRN
F801 T3.15A 250V AC
AGAINST FIRE HAZARD. FOR CONTINUED PROTECTION FUSE ONLY WITH SAME TYPE F801 T3.15A-250V AC
CAUTION :
POWER
Hochspannungseinstellung 27.5KV
VR801: 125V und
VR801 AVR
HOT
COLD
T801
CHROMA-PAL
DELAY-LINE
IC501
IC802
IC803
IC301
IC201
CN901
RVR01
VR201
VR501
CTN01
CTN02
CTN04
RIC01
RIC02
POWER DIRECT ON
SUB-BRIGHT
V-HEIGHT
IN OUT
12V
TP12V

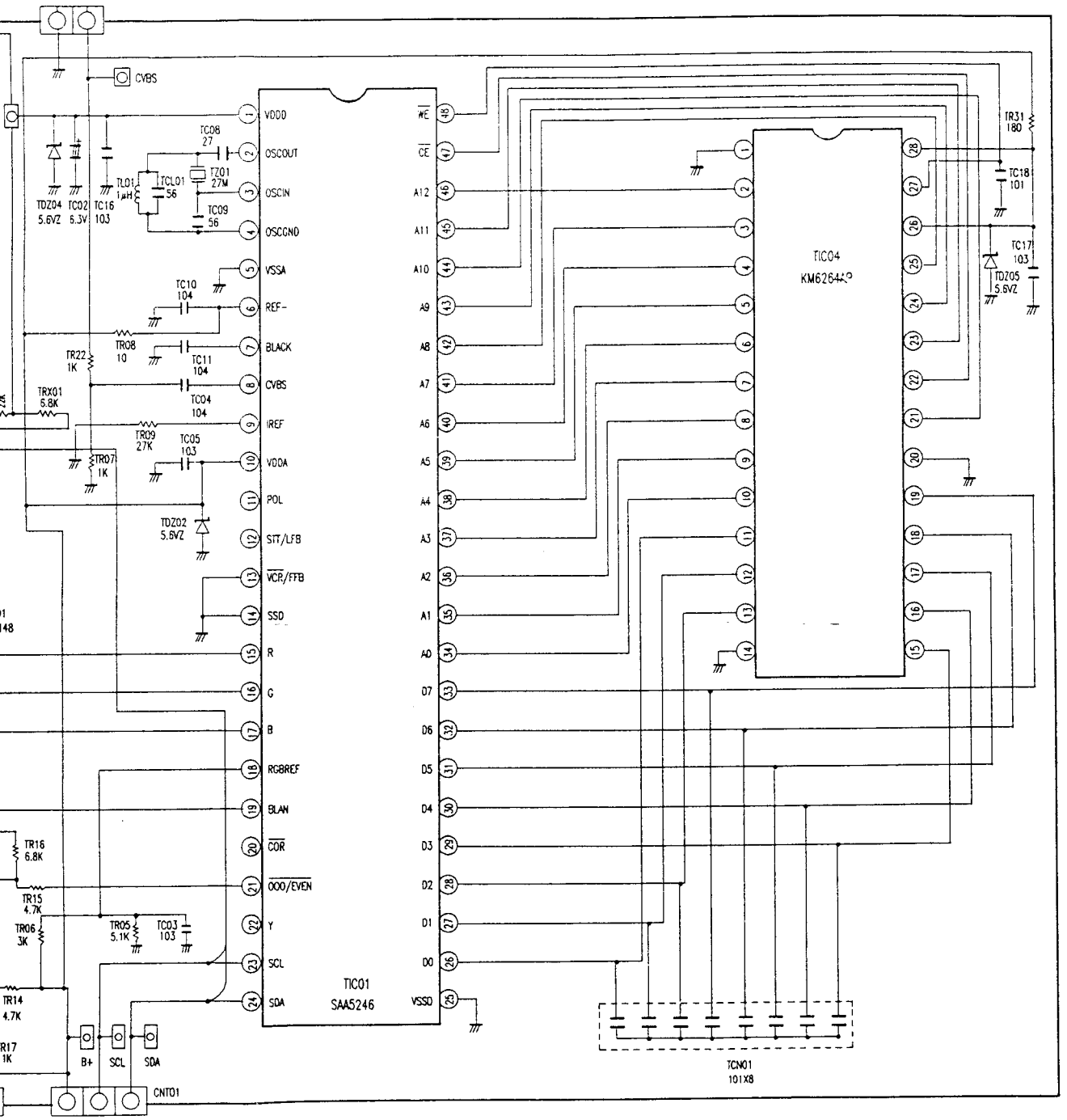
F+ P/MODE STORE
F- SEARCH CLEAR
SW104
P-PROCESS S/TIMER
SW102
SW103
TV
VT
J149
J903
C904
L901
L902
CRT1HK-FOCUS
B3084-125-641
P-58SCI(H)
VA66A
NC
BK
HEATER
GND
SCREEN
RK
GK
CN902
J902
R917
R920
R919
R918
R913
R914
R912
R910
R915
R908
R909
R907
C909
C902
C907
C903
C908
R902
R906
R905
Q902
Q903
Q904
Q901
J901
VR905
VR904
VR903
VR902
VR901
B-DRIVE
R-DRIVE
B-BAIS
G-BAIS
R-BAIS
RIC01
CTN04
CTN02
CTN01
RVR01
RIC02
DELAY-LINE
T501
VR501
IC501
IC602
ICS502
X201
X202
CN601
CN901
IC301
IC802
IC201
CHROMA-PAL
CHROMA-SECAM
SUB-BRIGHT
IN OUT
GND
12V

TELETEXT SCHEMATIC - DIAGRAM

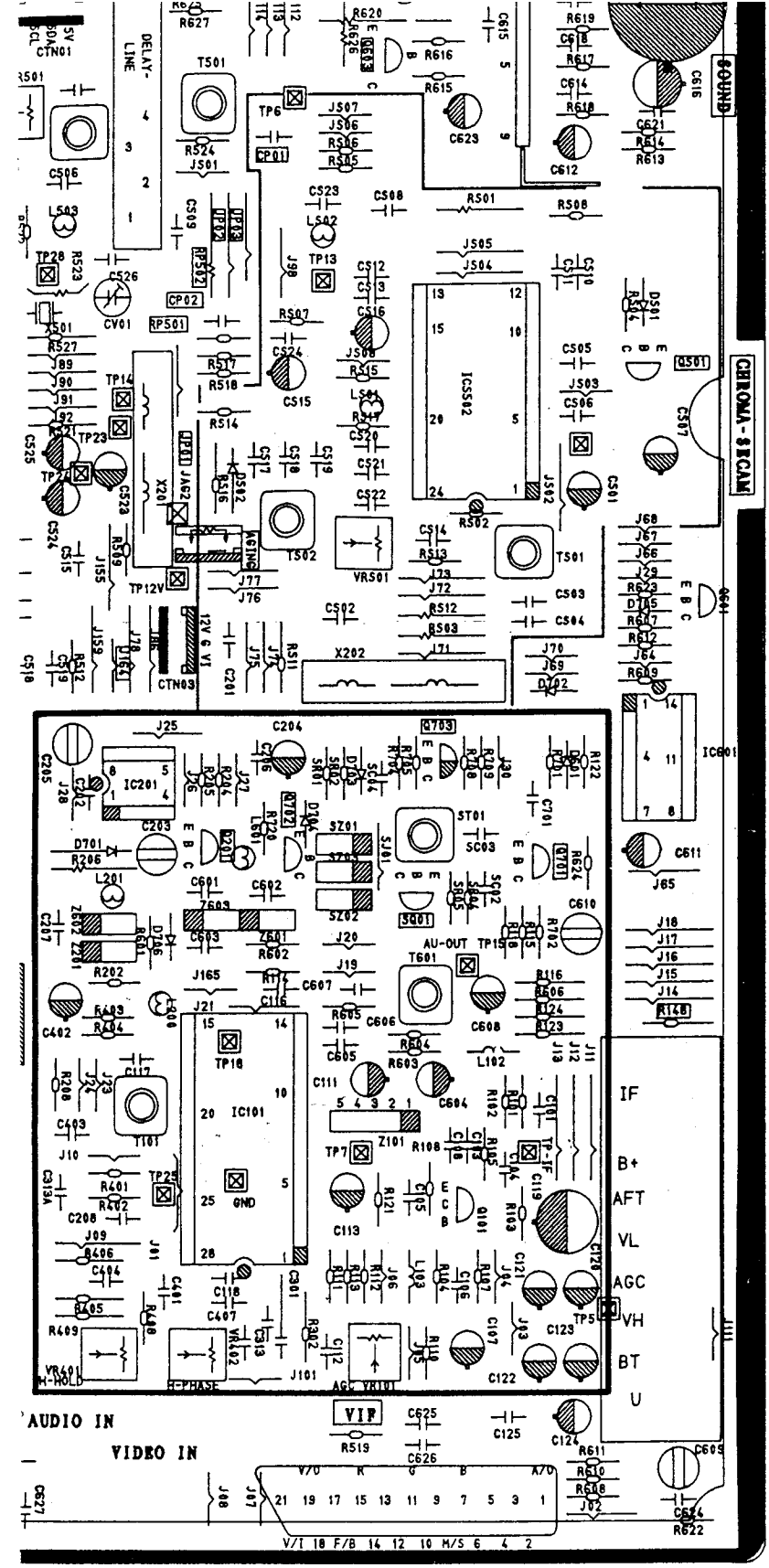


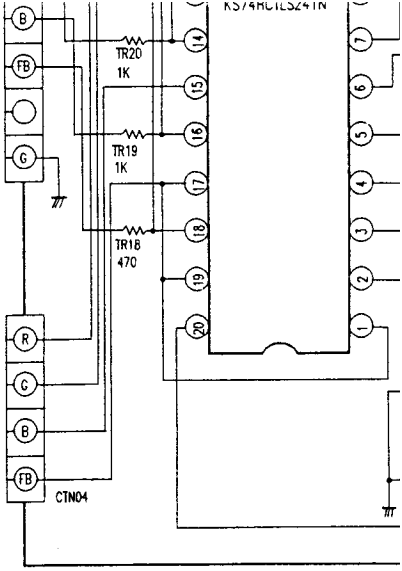


AGRAM


CVBS
VDDD
OSCOUT
OSCIN
OSCGND
VSSA
REF-
BLACK
CVBS
IREF
VDDA
POL
SIT/LFB
VCR/FFB
SSD
R
G
B
RGBREF
BLAN
COR
000/EVEN
Y
SCL
SDA
TIC01
SAA5246
WE
CE
A12
A11
A10
A9
A8
A7
A6
A5
A4
A3
A2
A1
A0
O7
O6
O5
O4
O3
O2
O1
O0
VSSD
TIC04
KM6264
TCN01
101X8
B+
SCL
SDA
CNT01

POWER
Hochspannungseinstellung 27.5KV
VR801: 125V und
VR801
AVR
HOT
COLD
CHROMA-PAL
SUB-BRIGHT
VR201
IC501
IC801
IC802
IC301
T801
T444
P58SC-H
01
HEATER
AFC
24V
180V
BU
ABL
125V
H-OUT
HIGH VOLTAGE
T401
H.D.T
VERT
V-HEIGHT
V-LIN
V-CEN
SCREEN
ADJUST
CN901
CN902
HEAT
CN44
VR501
DELAY-LINE
RVR01
IN OUT
AUDIO IN
VIDEO
H-HOLD
J36 12V
J37 MODE
J38 V-OUT
J31 GND
J32 V-F/B
J33 V-DRIVE
J34 SAND CASTLE
J35 H-DRIVE
3304-145-601
P1145601
C4
HORIZ


CHROMA-SECAM
IF
B+
AFT
VL
AGC
VH
BT
U
AUDIO IN
VIDEO IN
VIF
AU-OUT
H-PHASE
H-HOLD
AGC
IC101
IC201
ICS502
IC601
T501
T601
T101
X201
X202
VR401
VR402
VR101
Z101
TP7
TP15
TP18
TP25
TP-IF
GND
DELAY-LINE
CTN01
CTN03
CTN04
V/I 18 F/B 14 12 10 M/S 6 4 2
21 19 17 15 13 11 9 7 5 3 1
V/D R G B A/D


KS74HCTLS241N
TR20
1K
TR19
1K
TR18
470
CTN04

13. For added protection for this television receiver during a lightening storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna. This will prevent damage to the receiver due to lightning and power-line surges.
14. An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal.
15. Do not overload wall outlets and extension cords as this can result in fire or electric shock.
16. Never push objects of any kind into this television receiver through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a fire or electric shock. Never spill liquid of any kind on the television receiver.
17. Do not atempt to service this television receiver yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
18. Unplug this television receiver from the wall outlet and refer servicing to qualified service personnel under the following conditions:

a. When the power cord or plug is damaged or frayed.
b. If liquid has been spilled into the television receiver.
c. If the television receiver has been exposed to rain or water.
d. If the television receiver does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the television receiver to normal operation.
e. If the television receiver has been dropped or the cabinet has been damaged.
f. When the television receivers exhibits a distinct change in performance-this indicates a need for service.

19. When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer that have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock, or other hazards.
20. Upon completion of any service or repairs to this television receiver, ask the service technician to perform routine safety checks to determine that the television is in safe operating condition.
21. Television equipment and car combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the equipment and cart combination to overturn.

TABLE OF CONTENTS

1. INSTRODUCTION 1

2. CHASSIS BLOCK DIAGRAM 2

3. INSTALLATION AND SERVICE ADJUSTMENTS
   1. General informations 3
   2. Automatic Degaussing 3
   3. High Voltage Check 3
   4. B+ (+125V) Adjustment 3
   5. Horizontal Oscillator Adjustment 3
   6. Horizontal Phase Adjustment 3
   7. Vertical Height Adjustment 3
   8. Vertical Linearity Adjustment 3
   9. Focus Adjustment 3
   10. R-F AGC Adjustment 3
   11. APC Adjustment 4
   12. Colour Purity Adjustment 4
   13. Screen Voltage & White Balance Adjustment 4
   14. Convergence Adjustment
      1) Center Convergence Adjustment 4
      2) Circumference Convergence Adjustment ..... 5 - 6

4. GENERAL ALIGNMENT INSTRUCTIONS
   1. VIF (AFT) Alignment 7
   2. Sound (6.0MHz) Alignment 7
   3. PAL Colour Matrix Adjustment 7
   4. Quadrature Reference (DR/DB) 7

5. RM-109 REMOCON FEATURES
   1. The Illustration of RM-109 System Block 8
   2. Micro-Controller (PCA84C640P/030) Terminals Description ..... 8 - 9

6. TDA4601 (IC801) SPECIFICATION 9

7. NON-VOLATILE MEMORY 9

8. TELETEXT SECTION
   1. The Illustration System Block 10
   2. SAA 5246 Pin Diagram 10
   3. Terminals Description (SAA 5246P/H) 11

9. TROUBLE SHOOTING CHARTS ..... 12 - 15

10. INSERTING FROM OF THE IMPORTANT PARTS 16

11. CHASSIS REPLACEMENT PARTS LIST ..... 17 - 23

12. EXPLODED-VIEW ..... 24 - 25

13. SCHEMATIC DIAGRAM 26

14. PWB PATTERN AND LOCATION 27

1. INTRODUCTION

1. IC Line up

DESCRIPTION	SPECIFICATION	LOC. NO	REMARK
VIDEO SWITCHING IC	KA2186	IC201	
AUDIO SWITCHING IC	CD4066BCN	IC601	
VIF/SIF IC	TDA8305	IC101	
CHROMA/VIDEO IC	TDA3561A	IC501	
SECAM IC	TDA3590A	ICS502	
VERTICAL IC	KA2131	IC301	
REMOCON MICOM IC	PCA84C640P/030	RIC101	
MEMORY IC	85C72	RIC102	
POWER IC	TDA4601	IC801	
CHARACTER GENERATOR IC	SAA5246P/E	TIC01	
BUFFER IC	KS74HCTLS241	TIC02	
μ-COM IC	PCF84C81P/039	TIC03	OPTION
S-RAM IC	KM6264AP-10	TIC04	OPTION

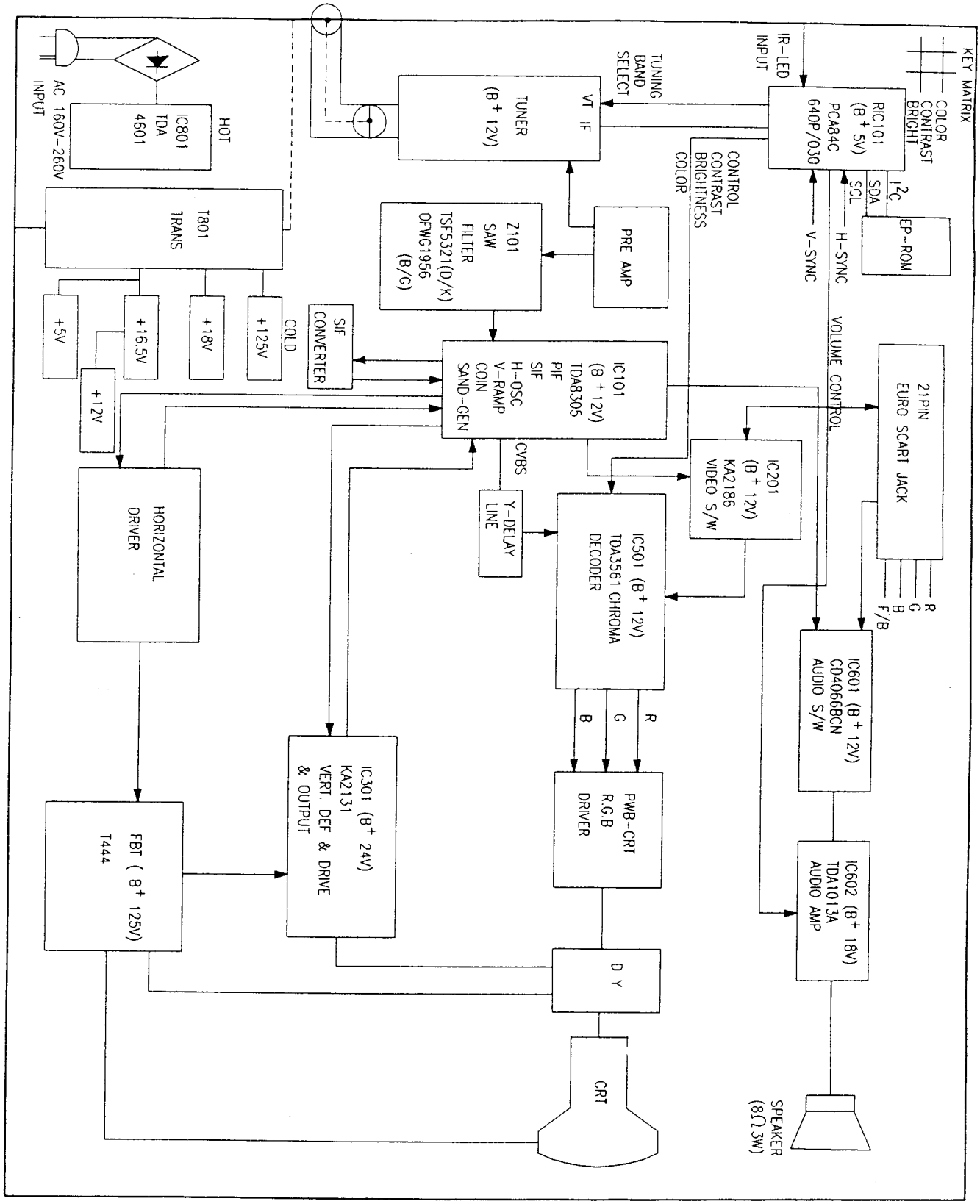
2. Means of Components Number Series

100 series .... Tuner/IF/AFT/AGC processing.
200 series .... Video/Luminance/Sync processing.
300 series .... Vertical deflection.
400 series .... Horizontal deflection.
500 series .... Chroma processing.
600 series .... Sound processing.
800 series .... AC input, power supply circuits.
900 series .... 12V regulator, 5V regulator, CRT drive circuits.
RR, RQ, RC, RIC series .... Remocon section.
SR, SQ, SC, SIC series .... Video/Chroma switching section.
TR, TQ, TC, TIC series .... TTX processing.

3. Abbreviation

ABCL ; Automatic Brightness Contrast Limitting
AC ; Alternating Current
ACC ; Automatic Color Control
AFC ; Automatic Frequency Control
AFT ; Automatic Fine Tuning
AGC ; Automatic Gain Control
AM ; Amplitude Modulation
APC ; Automatic Phase Control
APL ; Average Picture Level
AVC ; Automatic Volume Control
BPF ; Band Pass Filter
CTI ; Colour Transient Improvement
DAC ; Digital Analog Converter
DB ; Decibel
DC ; Direct Current
DIP ; Dual-in-line Package
DY ; Deflection York
D/A ; Digital to Analog
F.B ; Fast Blanking
FBT ; Flyback Trans
FM ; Frequency Modulation
HDT ; Horizontal Drive Trans
IC ; Integrated Circuit
I²C ; Inter Integrated Circuit
IF ; Intermediate Frequency
IFT ; Intermediate Frequency Trans
LLD ; Low Level Detector
LPF ; Low Pass Filter
MTS ; Multi Television Sound
NFB ; Negative Feed Back
NTSC ; National Television System Comittee System
NVRAM ; Non-Volatile Random Access Memory
OSD ; On Screen Display
PAL ; Phase Alternating by Line System
PCM ; Pulse Coded Modulation
PIF ; Picture Intermediate Frequency
PLL ; Pulse Locked Loop
PWM ; Pulse Width Modulation
RAM ; Random Access Memory
RF ; Radio Frequency
SAW ; Surface Acoustic Wave
SCL ; Serial Clock Line
SDA ; Serial Datat Access Line
SIF ; Sound Intermediate Frequency
SOPT ; Sound Output Pulse Frequency
SRPP ; Shunt Regulated Push Pull
S/N ; Signal Noise
TTE ; Triple Transit Echo
VCXO ; Voltage Controlled X'tal Oscillation

2. CHASSIS BLOCK DIAGRAM



3. INSTALLATION AND SERVICE ADJUSTMENTS

1. GENERAL INFORMATIONS

All adjustments are thoroughly checked and corrected when the receiver leaves the factory. Therefore, the receiver should operate normally and produce proper colour and B/W picture upon installation.
However minor service adjustments may be required depending on the particular location in which the receiver is operated. This receiver is shipped completely in cardboard carton. Carefully draw out the carton and remove all the packing materials. Plug the power cord into two convenient pin power outlet. Turn on the receiver and adjust the fine tuning for the best picture detail.
Check and adjust all the customer controls such as BRIGHTNESS, CONTRAST and COLOUR Controls to obtain the natural colour or B/W picture.

2. AUTOMATIC DEGAUSSING

A degaussing coil is mounted around the picture tube so that external degaussing after moving the receiver is normally unnecessary, providing the receiver is properly degaussing upon installation. The degaussing coil operates for about 1 second after the power to the receiver is switched ON.
If the set is moved or faced in a different direction, the power switch must be switched off at least 10 minutes in order that the automatic degaussing circuit operates properly.
Should the chassis or parts of the cabinet become magnetized and cause the poor colour purity, use an external degaussing coil. Slowly move the degaussing coil around the face-place of the picture tube, the sides and the rear of the receiver and slowly withdraw the coil to distance of about 2 m before disconnecting it from AC source. If colour shading still persists, perform the COLOUR PURITY ADJUSTMENT and CONVERGENCE ADJUSTMENTS procedures as mentioned later.

3. HIGH VOLTAGE CHECK

Caution: There is no HIGH VOLTAGE ADJUSTMENT on this chassis. But B+ power must be adjusted in +125V under the full colour bar pattern and the normal picture control level.

1) Connect an accurate high voltage meter to the second anode of the picture tube.
2) Turn on the receiver. Set the BRIGHTNESS and CONTRAST control to minimum (zero beam).
3) The high voltage should be measured less than 25KV.
4) Rotate the BRIGHTNESS and CONTRAST controls to both extremes to be sure that the high voltage does not exceed the limit of 25.5KV under any conditions.

4. B+ (+125V) ADJUSTMENT

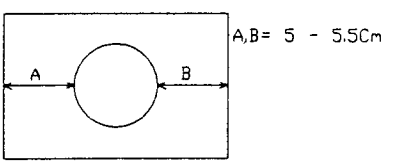
1) Receive the lion-head pattern.
2) Set the Bright and Contrast condition to maximum.
3) Connect Digital voltmeter to R821.
4) Adjust the VR801 to +125V.

5. HORIZONTAL OSCILLATOR ADJUSTMENT

If there is an indication of unstable horizontal sync, adjust the HORIZONTAL HOLD control (VR401) to remove the condition. When you adjust the Horizontal Hold control, you should short TP25 and GND for the H-oscillator adjustment.

6. HORIZONTAL PHASE ADJUSTMANT

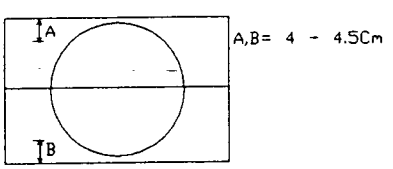
If you want to move the center of picture, adjust HORIZONTAL phase control (VR402).



(STANDARD)

7. VERTICAL HEIGHT ADJUSTMENT

The SIZE control (VR301) on the main board changes the size of the picture, having an equal effect on the top and bottom (Lion Head Pattern).



(STANDARD)

8. VERTICAL LINEARITY ADJUSTMENT

1) Receive the Lion-head Pattern.
2) Make the Pattern to be one circle by using the vertical Linearity VR (VR302).
3) Make the two semicircle of the circle to be same type.

9. FOCUS ADJUSTMENT

1) Set the Bright and Contrast condition to maximum.
2) Adjust FOCUS Control on FBT for well defined scanning lines in the centre area of the screen.

10. R-F AGC ADJUSTMENT

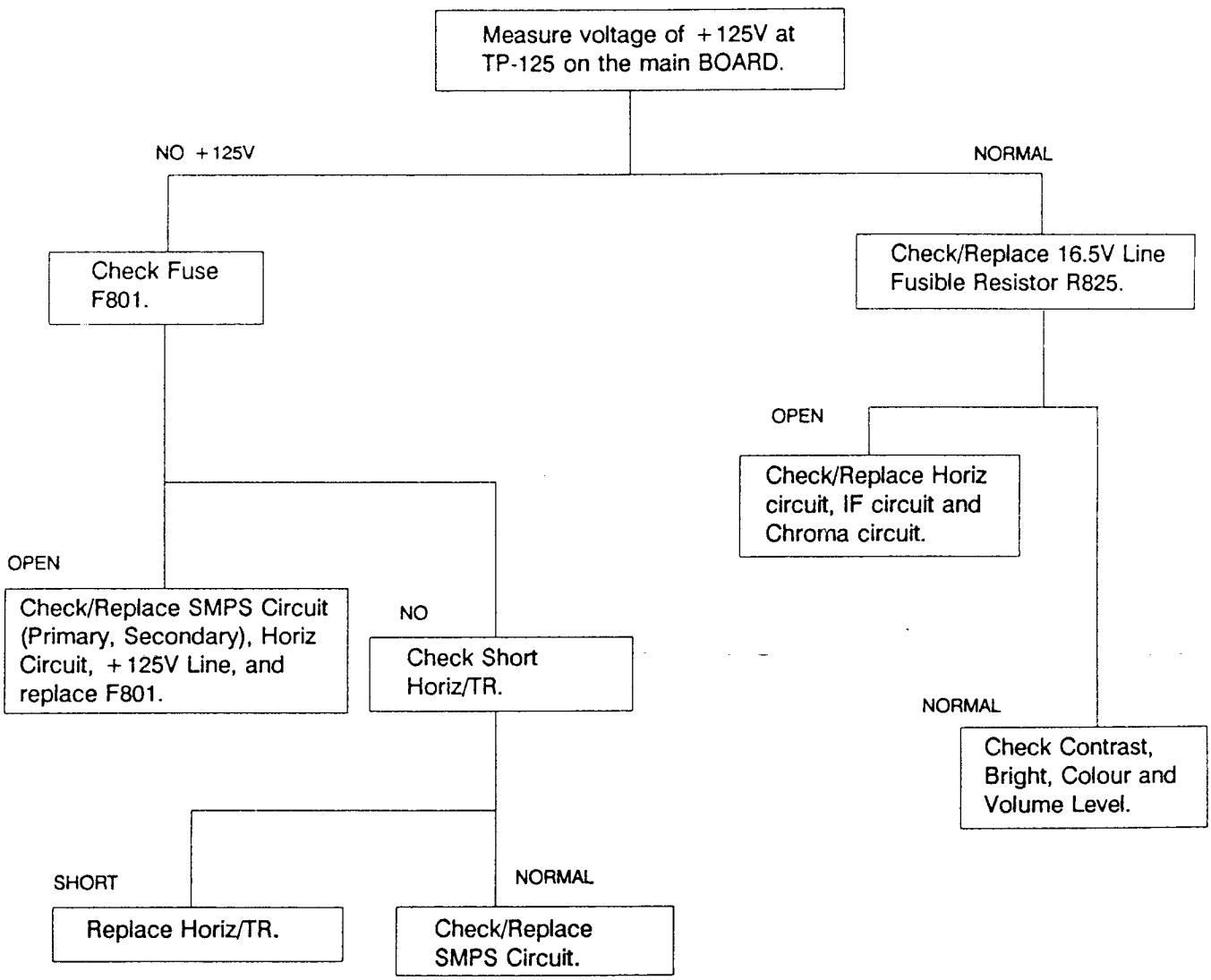
1) Recive the 60dB RT Pattern to be input.
2) Tune the set in the strongest station in your area.
3) Turn AGC control (VR101) on the IF board fully clockwise position.
4) Adjust AGC control until noise (snow) disappears from the screen.

9. TROUBLESHOOTING CHARTS

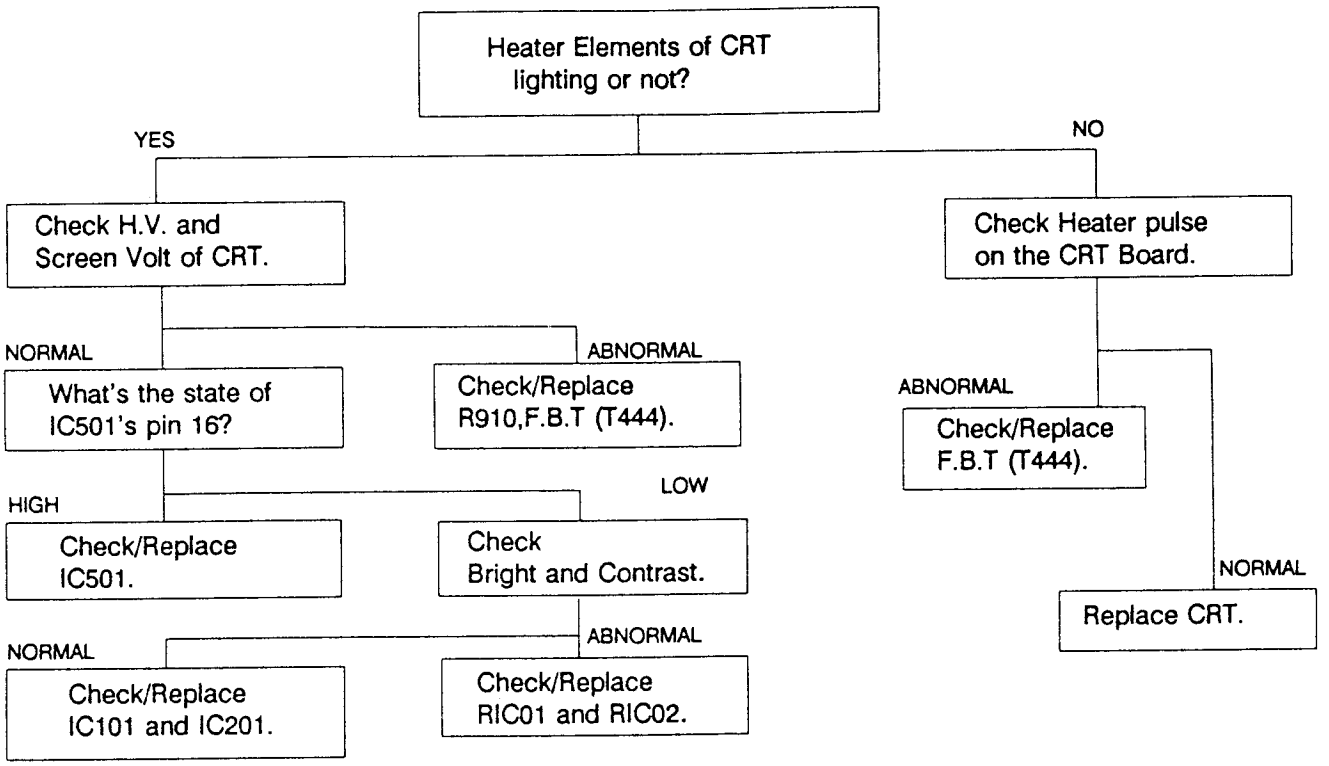
The following charts are devoted to the troubleshooting which, if followed carefully, will assist you in tracking down a fault to the correct stage.
In order to utilize the charts (fault trees), first establish the complains, i.e.-No Raster, No Sound.

Locate the chart applicable and then, progress through the various alternatives until a final block indicates the defective components or stages.

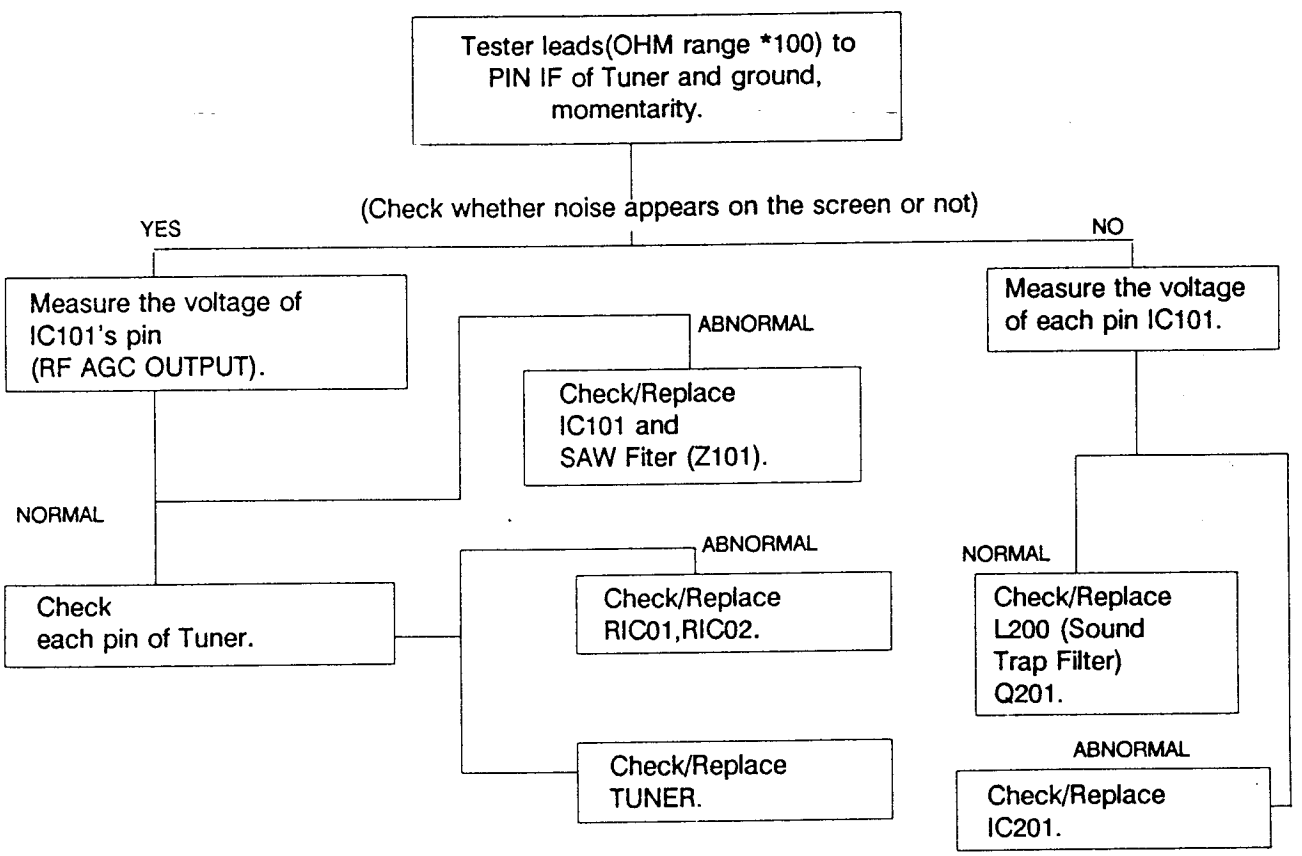
NO RASTER AND NO SOUND



NO RASTER (SOUND OK)



NO PICTURE (RASTER ON) AND NO SOUND

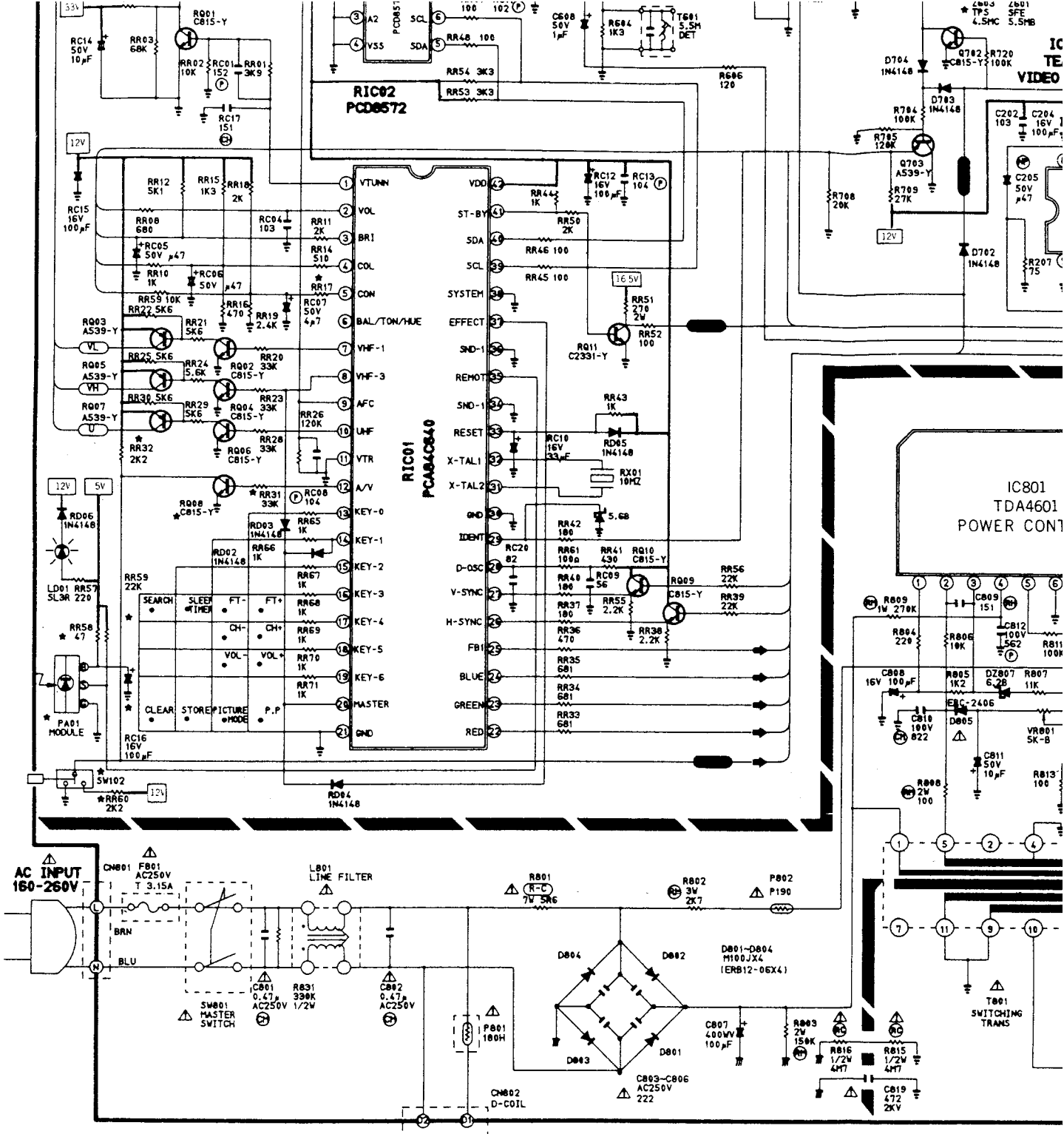


Loc No	Supplier Parts No.	Specification
SPK	34209-169-140	5902BR 3W
		TUNER
**TU001	34519-970-060	ECC-5883CE(D)
		FILTERS
Z101	34529-450-010	TSF5305
Z201	34527-460-008	TPS6.0MBTF21
Z601	34527-460-007	SFE6.0MBTF21
		CRYSTALS
RX01	34539-001-000	10MHZ
X501	34537-001-020	8.867238MHZ(TAPG)
		FUSE
**FUSE	34709-084-730	FST 250V 3.15A 20MM SEMK
		MISCELLANEOUS
JV2	33054-833-011	P1/1015/600/1
SPK-L	33058-003-016	S3(2)/F/400
CN902	33058-302-020	B3XB3/F/500
CN901	33058-322-016	B5XB5/F/400
PERI	33136-103-030	HXC-1510-01-300A(R)
F/CLIP	33167-001-001	PFC 5000-0202
CTN02	33347-108-140	67094-006 (AUTO)
CN201	33347-108-180	67094-005 (AUTO)
AG	33347-108-310	67094-003(AUTO)
CTN03	33347-108-310	67094-003(AUTO)
CTN01	33347-108-310	67094-003(AUTO)
CN601	33347-108-310	67094-003(AUTO)
CTN04	33347-114-810	YW025-04(AUTO)
SW801	33529-402-006	ESB-99832V
TACT-6	33606-101-009	KPT-2105-31(R)
TACT-2	33606-101-010	KPT2105 ROBOT
BODY	34543-112-910	SPTE T0.25 P58SC,NO CUT
CLMP/W	36633-101-310	ABS V0 NTR
CLMP/W	36633-101-310	ABS V0 NTR
CLMP/W	36635-112-010	NYLON 6.6 DONG-A DATL-60
		ASSY-H/SINK VERT(SOUND)
	*3H82-00070-000	35684-116-210,TDA1013A
**IC602	32119-201-070	TDA1013A/N4
H/SINK	35684-116-210	SPC-1 T1.0 FT2 <S.N.A>
SCREW	37158-230-061	2S-3X6 FE FZY <S.N.A>
		ASSY-H/SINK VERT(POWER)
	*3H82-00080-000	35684-113-710,TDA4601
**IC801	32119-401-010	TDA4601
H/SINK	35684-113-710	CUSI 1/2H T0.5 <S.N.A>
SCREW	37048-130-061	+M3X6 FE FZY <S.N.A>
WASHER	37208-113-001	1-M3 FE FZY <S.N.A>
		ASSY-H/SINK VERT(HORI)
	*3H82-00170-001	35684-118-110,2SD1651

Loc No	Supplier Parts No.	Specification
**Q402	32159-210-003	2SD1651YD
H/SINK	35684-118-110	SPC-1 T1.0 FT2 <S.N.A>
SCREW	37158-230-101	2S-3X10 FE FZY <S.N.A>
WASHER	37334-105-910	SPC-1 T1.0 FZY-1 <S.N.A>
		ASSY-H/SINK VERT
	*3H82-00170-003	35684-118-110,KA2131
**IC301	32119-102-300	KA 2131
H/SINK	35684-118-110	SPC-1 T1.0 FT2 <S.N.A>
HOLD/W	36604-134-510	NYLON 66 V0 NTR <S.N.A>
SCREW	37148-530-081	2S-3X8 FE FZY <S.N.A>
SCREW	37158-230-061	2S-3X6 FE FZY <S.N.A>
		ASSY-H/SINK POWER
	*3H83-00200-000	35684-118-411,2SC3552
**Q801	32159-210-004	2SC3552YC-L
H/SINK	35684-118-411	A1050S-H14 T2.0 <S.N.A>
SCREW	37158-230-101	2S-3X10 FE FZY <S.N.A>
		ASSY-H/SINK TR
	*3H84-00020-000	35684-118-330,MC7812C
**IC802	32119-901-110	MC7812C (AUTO)
H/SINK	35684-118-330	A6063 EXTR BLK <S.N.A>
SCREW	37158-230-061	2S-3X6 FE FZY <S.N.A>
		A S S Y - A C C E S S O R Y
WRNT/C	38124-128-410	ART PAPER 120(S) U.K,AKA
I/B	38134-397-810	ART PAPER 120(S) CT2125U
PE-BAG	38653-108-161	HDPE T0.015 400X230 NO
		A S S Y - P W B S U B T T X
	*3D31-00810-040	CI5322T
PWB	33004-145-251	10X130X1.6T <S.N.A>
		RESISTORS
TR03	31018-177-472	RD 1/8T 4.7K-J
TR05	31018-177-512	RD 1/8T 5.1K-J
TR06	31018-177-302	RD 1/8T 3K-J
TR07	31018-177-302	RD 1/8T 3K-J
TR08	31018-177-100	RD 1/8T 10-J
TR09	31018-177-273	RD 1/8T 27K-J
TR12	31018-177-105	RD 1/8T 1M-J
TR14	31018-177-472	RD 1/8T 4.7K-J
TR15	31018-177-472	RD 1/8T 4.7K-J
TR16	31018-177-682	RD 1/8T 6.8K-J
TR17	31018-177-113	RD 1/8T 11K-J
TR18	31018-177-471	RD 1/8T 470-J
TR19	31018-177-102	RD 1/8T 1K-J
TR20	31018-177-102	RD 1/8T 1K-J
TR21	31018-177-102	RD 1/8T 1K-J
TR22	31018-177-102	RD 1/8T 1K-J
TR31	31018-177-330	RD 1/8T 33-J
TR32	31018-177-560	RD 1/8T 56-J
TR33	31018-177-223	RD 1/8T 22K-J
TRX01	31018-177-682	RD 1/8T 6.8K-J

Loc No	Supplier Parts No.	Specification
	CAPACITORS	
TC03	31417-109-140	CK45 TAPG F 50V 103-Z
TC04	31507-127-012	EVQB1 H 104J-F3/2E 63V 1
TC06	31417-109-140	CK45 TAPG F 50V 103-Z
TC08	31407-105-280	CC45(T) CH 50V 560-J
TC09	31407-048-560	CC45(T) RH 50V 560-K
TC10	31507-127-012	EVQB1 H 104J-F3/2E 63V 1
TC11	31507-127-012	EVQB1 H 104J-F3/2E 63V 1
TC12	31607-402-220	CE04W TAPG 50V 2.2M
TC13	31407-048-270	CC45(T) RH50V 270-K
TC14	31407-048-270	CC45(T) RH50V 270-K
TC15	31607-401-140	CE04W TAPG 6.3V 1000M-M
TC16	31417-109-140	CK45 TAPG F 50V 103-Z
TC17	31417-109-140	CK45 TAPG F 50V 103-Z
TC18	31407-105-660	CC45(T) CH 50V 101-J
TC19	31607-401-470	CE04W TAPG 16V 100M VENT
TC20	31417-109-140	CK45 TAPG F 50V 103-Z
TC25	31407-105-280	CC45(T) CH 50V 560-J
TC26	31607-401-470	CE04W TAPG 16V 100M VENT
TCN01	31499-009-400	B9HC0118-33N(9P 100PF)
TCN02	31499-009-340	EXF-P4 331MW/NCYB1H331M0
	I C	
TIC01	32109-110-017	SAA5246P/E
TIC02	32109-310-025	KS74HCTLS241
TIC03	32109-101-380	MAB8461P/W115
TIC04	32109-201-410	KM6264AP-10
	TRANSISTORS	
TQ03	32137-301-720	KSC 815-Y(TAPG)
TQ04	32137-301-720	KSC 815-Y(TAPG)
TQ05	32137-301-720	KSC 815-Y(TAPG)
	DIODES	
TD01	32167-406-480	1N4148 TAPG
TD02	32167-406-480	1N4148 TAPG
TD03	32167-406-040	MTZ 3.6A
TDX01	32167-406-480	1N4148 TAPG
TDZ02	32167-408-080	EQA02-06D/MTZ6.2B(TAPG)
TDZ03	32167-408-080	EQA02-06D/MTZ6.2B(TAPG)
TDZ04	32167-408-080	EQA02-06D/MTZ6.2B(TAPG)
	COIL	
TL01	32427-805-110	1UH-M
	CRYSTALS	
TZ01	34539-071-040	HC-18/U,6MHZ
TZ02	34539-001-018	27MHZ
	MISCELLANEOUS	
CTN01	33058-004-020	S3XS3/F/500
CTN02	33058-017-020	S6XS6/F/500
CTN03	33058-100-594	S3XS3/2405/500
CTN04	33050-006-020	Y4XY4/F/500
CTN01	33347-108-310	67094-003(AUTO)
CTN02	33347-108-140	67094-006 (AUTO)

Loc No	Supplier Parts No.	Specification
CTN03	33347-108-310	67094-003(AUTO)
CTN04	33347-114-820	YW025-04(AUTO,NO TUBE)
TTX/H	36602-104-610	ABS V0 GRAY CX-5322T
SCREW	37148-530-081	2S-3X8 FE FZY
	A S S Y - C R T	
**V888	32019-255-108	54HGB99X-ITC
	A S S Y - T R A N S M I T T E R	
	*3F14-00022-152	TM22,RM109,43,BLK(AAA)
PWB	33004-540-021	CF5913W <S.N.A>
XR01	31018-277-159	RD 1/4T 1.5-J
XR02	31018-177-103	RD 1/8T 10K-J
XR03	31018-177-473	RD 1/8T 47K-J
XR04	31018-177-101	RD 1/8T 100-J
XR05	31018-177-102	RD 1/8T 1K-J
XR06	31018-177-680	RD 1/8T 68-J
XR07	31018-177-682	RD 1/8T 6.8K-J
XC01	31607-401-460	CE04W TAPG 16V 47M
XIC01	32109-110-030	SAA3010T
XQ01	32137-401-530	KSA 539-Y(TAPG)
XQ02	32137-301-720	KSC 815-Y(TAPG)
XD01	32309-101-100	CL-2/SSIR-5C
D2	33104-103-920	RA 317(2095)
RUBBER	33142-106-120	SILICON RUBBER 43KEY
TER-B,A	33144-110-310	NSPX T0.3
TER-B,C	33144-110-510	NSPX T0.3
XZ01	34539-050-010	CSB455EBL/KBR455BKTLR
CASE-T	36031-110-510	ABS HB BLK #677
CASE-B	36031-110-610	ABS HB BLK #677
BATT/C	36033-104-210	ABS HB BLK,AAA
SPRG-C	36674-137-210	STS-304 PI0.5
SPRG-B	36674-145-610	NICO SUS 0.4PI
SCREW	37118-530-103	2S-3X10 FE FZB
LID/B	37643-149-010	ABS HB BLK #677
WINDOW	37653-119-010	P.C 141-21051 CT-2592
PVC	37802-117-150	PVC SHEET T0.3 BLK CX-53
PE-BAG	38653-108-081	LDPE T0.08 250X90



DIFFERENT PARTS FOR 20 INCH AND 14 INCHS

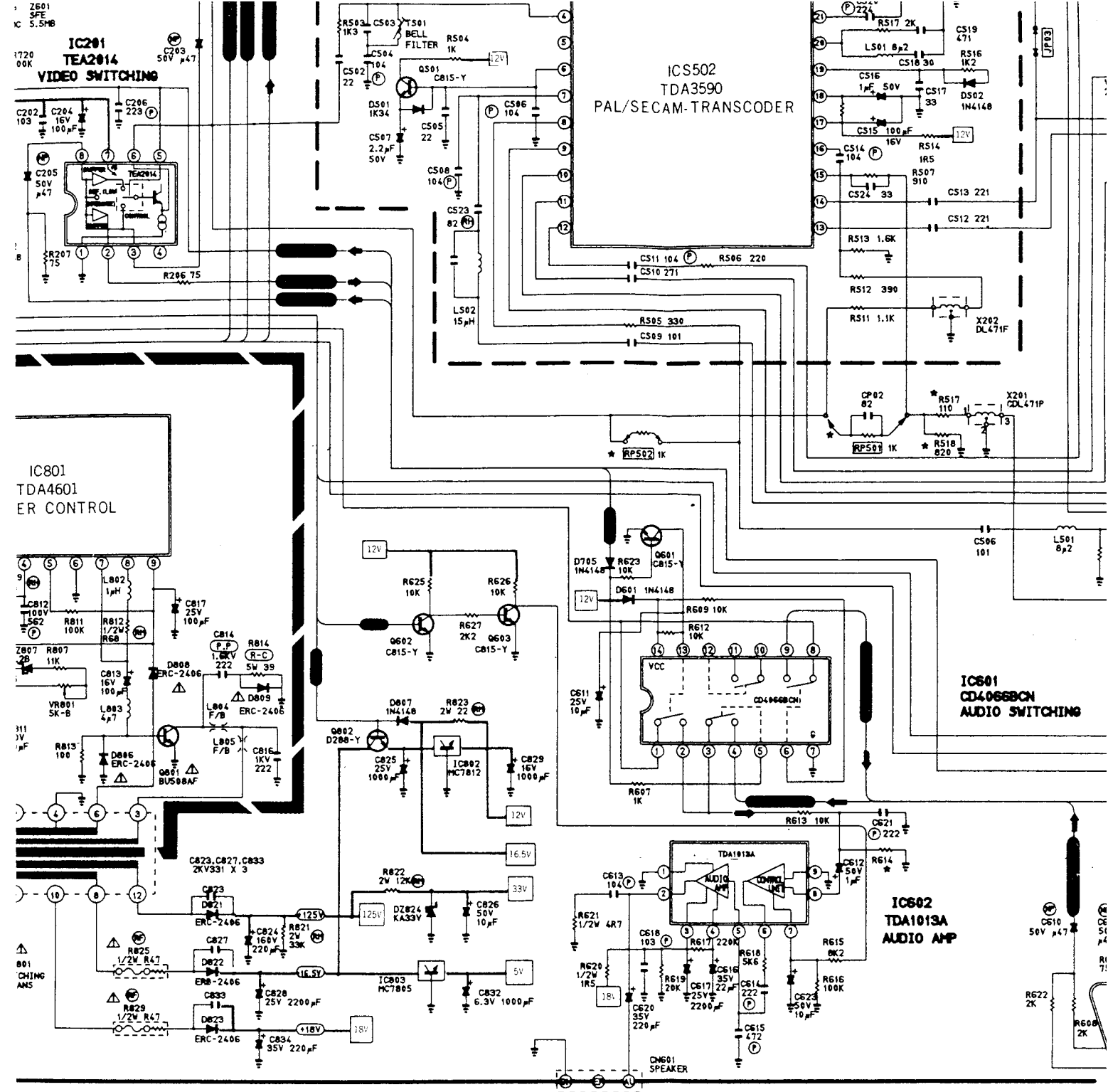
LOCATION	14 INCH		20 INCH	21 INCH
	NORMAL	MINI-NECK		
NR002	1/2W 1K5		1/2W 1K5	
NC001	25V 330μF		25V 330μF	
NC002	16V 68μF		16V 68μF	
R614	3K3	7K5	4K3	7K5
R210	133K-F(1/2W)	133K-F(1/2W)	127K-F(1/2W)	120K-G(1/2W)
C419	200V 364	200V 364	200V 434	200V 434
L401		200mH/480mH		350mH
L404	DS48-157μH	DS48-157μH	DS48-157μH	DS48-157μH
T402	K-20-14		K-20-14	
Q402	2SD1650	2SD1650	2SD1651	2SD1651
T444	FCM1415AL	FCM-14A004	FCM-2015AL	FCM20A015
V999	3720B22	A34EAC00X	51GGH91X	54HGB99X
RR17	3K	3K	1K	1K
RR19	2K4	2K4	3K	3K
R506	8K2	10K	10K	10K
L902	12μH	12μH	25μH	12μH
R921	RF1P (0.47)	RF1P(0.47)	RF1P (1)	RF2P (1.9)
MR001				2.4K (1/2W)
VR304				5K-B

DIFFERENT PART
FOR SOFT-TOUCH AND REMOCON MODEL

LOCATION	SOFT-TOUCH	REMOCON
SW102	KSA-2272	
RR60	2K2	
PA01		LTMP034 or SC 5CP
RC16		16V 100μF
RR58		1/8W 47
RR59		1/8W 22K
RR32		1/2 W 2K2
RR31		1/8W 33K
RQ08		C815-Y

DIFFERENT PARTS FOR
PAL-B/G AND SECAM-B/G,D/K

LOCATION	PAL-B/G	PAL-B/G SECAM-B/
RS17	1K	110
RS18	620	820
RPS01	820	
RPS02	1K	
CP01	103	
R601	220Ω	220Ω
C602	47	47
L601	12μH	12μH
CP02	82	
Z603		



RESISTOR	
TYPE	MARK
Carbon Composition	C
Oxide Metal Film	M
Metal Film	RM
Cement	R-C
Variable Resistor	
Positive Resistor	

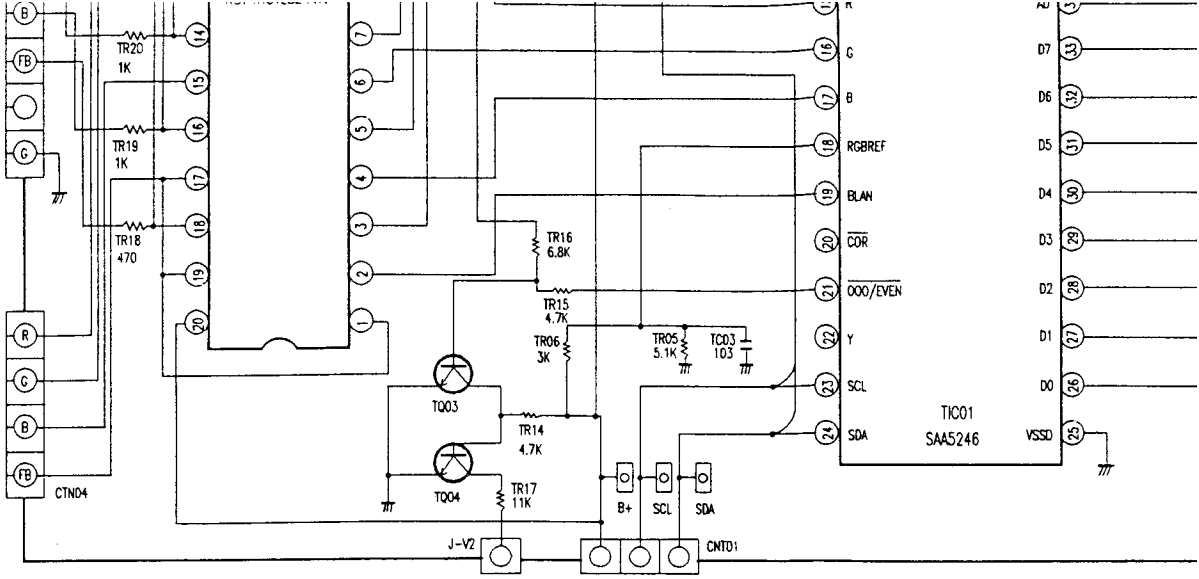
CAPACITOR	
TYPE	MARK
Ceramic	No Mark
Polyester	P
Tantalum	T
Metal Polyester	MP
Polypropylene	P.P
Polyester Polypro	DSR
Chemical Electrolytic	
Chemical Non-Polar	

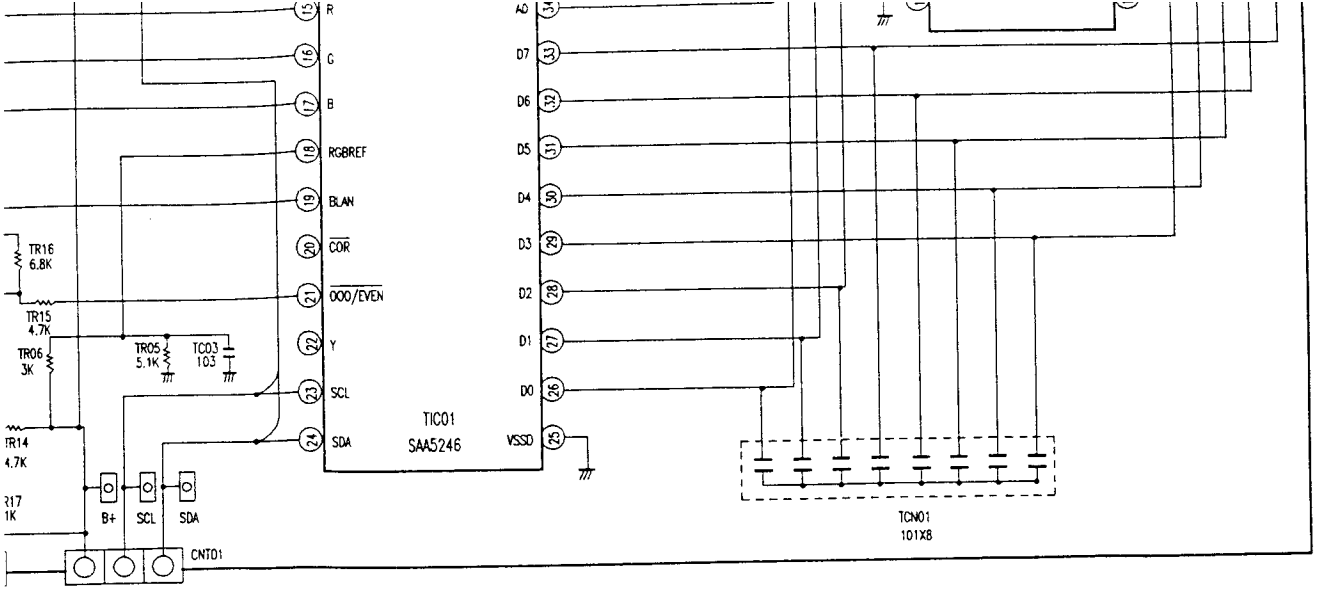
FOR
M-B/G,D/K

PAL-B/G SECAM-B/G	PAL-B/G SECAM-B/G SECAM-D/K
110	110
820	820
220Ω	75Ω
47	33P
12μH	8.2μH
	TP56.SMC

OBSERVATION OF VOLTAGES AND WAVEFORMS

1 Voltages read with "VTVM" from point shown to chassis ground, line voltage 220/240V colour bar signal.
2 Voltages reading may vary ±20%.
3 The schematic shown is representative only.
4 All wavefroms are taken using a wide band oscilloscope and a low capacity probe.
5 Check FINE TUNING,AGC,BRIGHTNESS,CONTRAST,and COLOUR controls for best picture.
6 Waveforms are taken using a standard colour bar signal.


B
FB
C
TR20
1K
TR19
1K
TR18
470
R
C
B
FB
CTN04
TR16
6.8K
TR15
4.7K
TR06
3K
TR05
5.1K
TC03
103
TQ03
TR14
4.7K
TQ04
TR17
11K
J-V2
B+
SCL
SDA
CNT01
R
G
B
RGBREF
BLAN
COR
OOO/EVEN
Y
SCL
SDA
TIC01
SAA5246
VSSD
D7
D6
D5
D4
D3
D2
D1
D0


R
G
B
RGBREF
BLAN
COR
OOO/EVEN
Y
SCL
SDA
TIC01
SAA5246
A0
D7
D6
D5
D4
D3
D2
D1
D0
VSSD
TR16
6.8K
TR15
4.7K
TR06
3K
TR05
5.1K
TC03
103
TR14
4.7K
B+
SCL
SDA
CNTD1
TCN01
101X8